WEST VIRGINIA UNIVERSITY BULLETIN

1986-87

UNDERGRADUATE CATALOG

Towers Station of WVU's Personal Rapid Transit (PRT) system which serves as a national transportation research laboratory and provides service between five stations for students, faculty, and staff. In 10 years the PRT has carried more than 22 million passengers without an accident on computer-directed, electric-powered, driver-less cars that glide along 8.7 miles of guideways at up to 30 miles an hour. The PRT connects downtown Morgantown and the two WVU campuses which are 1½ miles apart. Towers Residence Halls are in the background.

Mountainlair—the student union on the Downtown Campus.

COVER—Moore Hall, which houses the offices of the Division of Student Affairs among other units, has been added to the National Register of Historic Places, the official list of America's cultural attractions. Moore Hall, completed in 1928, joins seven other WVU Downtown Campus structures on the list.

WEST VIRGINIA UNIVERSITY

1986-87 Undergraduate Catalog

The *1986-87 West Virginia University Undergraduate Catalog* is a general source of information about course offerings, academic programs and requirements, expenses, rules, and policies. The courses, requirements, and regulations contained herein are subject to continuing review and change by the West Virginia Board of Regents, University administrators, and the faculties of the schools and colleges to best meet the goals and objectives of the University. The University, therefore, reserves the right to change, delete, supplement or otherwise amend at any time the information, course offerings, requirements, rules, and policies contained herein without prior notice.

Edited by Stanley J. Nels
Associate University Editor

1986

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UNIVERSITY CALENDAR, 1986-87

Summer Sessions, 1986

May 19, Monday ..... Registration, First Summer Session
May 19, Monday ..... First Classes
May 26, Monday ..... Memorial Day Recess
June 30, Monday ..... Last Classes
June 30, Monday ..... Registration, Second Summer Session
July 1, Tuesday ..... First Classes
July 4, Friday ..... Independence Day Recess
August 9, Saturday ..... Last Classes

First Semester, 1986-87

August 21, 22, Thursday and Friday ..... New Student Orientation
August 22, Friday ..... General Registration
August 25, Monday ..... First Classes
August 25, Monday ..... Late Registration Fee in Effect for All Students
August 29, Friday ..... Last Day to Register, Add New Courses, Make Section Changes, Change Pass/Fail and Audit
September 1, Monday ..... Labor Day Recess
October 4-5, Saturday and Sunday ..... Rosh Hashanah—Days of Special Concern
October 10, Friday ..... Mid-Semester
October 10, Friday ..... Mid-Semester Reports Due
October 13, Monday ..... Yom Kippur—Day of Special Concern
October 31, Friday ..... Last Day to Drop a Class
November 4, Tuesday ..... General Election Day Recess
November 22, Saturday, to November 30, Sunday, inclusive ..... Thanksgiving Recess
December 11, Thursday ..... Last Day to Withdraw From University
December 12, Friday ..... Last Classes
December 15, Monday, to December 20, Saturday, inclusive ..... Final Examinations
December 21, Sunday, to January 8, Thursday, inclusive ..... Christmas Recess

Second Semester, 1986-87

January 9, Friday ..... General Registration
January 12, Monday ..... First Classes
January 12, Monday ..... Late Registration Fee in Effect for All Students
January 16, Friday ..... Last Day to Register, Add New Courses, Make Section Changes, Change Pass/Fail and Audit
January 19, Monday ..... Martin Luther King, Jr. Birthday Recess
February 7, Saturday (Not a Holiday) ..... West Virginia University Day
February 16, Monday ..... Presidents' Day Recess
February 27, Friday ..... Mid-Semester
February 27, Friday ..... Mid-Semester Reports Due
March 7, Saturday, to March 15, Sunday, inclusive ..... Spring Recess
March 20, Friday ..... Last Day to Drop a Class
April 14, Tuesday ..... Faculty Assembly
April 14, Tuesday ..... Passover—Day of Special Concern
April 17, Friday ..... Easter Recess
April 30, Thursday ..... Last Day to Withdraw From University
May 1, Friday ..... Last Classes
May 4, Monday, to May 9, Saturday, inclusive ..... Final Examinations
May 11, Monday ..... Grade Reports for All Graduates Due in Dean's Office
May 13, Wednesday ..... Dean's Reports for All Graduates Due in Office of Admissions and Records
May 16, Saturday ..... Alumni Day
May 17, Sunday ..... Commencement

The WVU academic year is divided into two semesters of about seventeen weeks each and summer sessions. [Revised 3-10-86]

West Virginia Board of Regents

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Charleston, WV 25301

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Thomas W. Cole, *Acting Chancellor,* Institute

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Office of the President
Morgantown, WV 26506

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West Virginia University is an Equal Opportunity-Affirmative Action institution. In compliance with Federal Executive Order No. 11246 as amended, Title VII of the Civil Rights Act, West Virginia Human Rights Act, Title IX (Educational Amendments of 1972), Sections 503 and 504 of the Rehabilitation Act of 1973, and other applicable laws and regulations, the University provides equal opportunity to all prospective and current members of the student body, faculty, and staff on the basis of individual qualifications and merit without regard to race, sex, religion, age, national origin, or handicap, as identified and defined by law.

The University neither affiliates knowingly with nor grants recognition to any individual, group, or organizaion having policies that discriminate on the basis of race, color, age, religion, sex, national origin, or handicap, as defined by applicable laws and regulations.

—Office of the President

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Director, Housing and Residence Life
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Morgantown, WV 26506

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Student Financial Aid Office
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WEST VIRGINIA UNIVERSITY

President's Cabinet

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John W. Fisher, II, J.D., *Executive Officer*

Deans

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College of Arts and Sciences, Thomas J. Knight, Ph.D.
College of Business and Economics, Arthur Kraft, Ph.D.
Bureau of Business Research, Stanley J. Kloc, M.B.A., Director
College of Creative Arts, Philip J. Faini, M.M. *(Interim Dean)*
School of Dentistry, W. Robert Biddington, D.D.S.
College of Engineering/Engineering Experiment Station, Curtis J. Tompkins, Ph.D., Dean/Director
College of Human Resources and Education, Diane L. Reinhard, Ph.D.
Perley Isaac Reed School of Journalism, Guy H. Stewart, Ph.D.
College of Law, Carl M. Selinger, J.D.
School of Medicine, Richard A. DeVaul, M.D.
College of Mineral and Energy Resources, John L. Schroder, Jr., M.S.E.M.
School of Nursing, Lorita D. Jenab, Ed.D.
School of Pharmacy, Sidney A. Rosenbluth, Ph.D.
School of Physical Education, J. William Douglas, Ph.D.
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School of Social Work, Nancy L. Lohmann, Ph.D.
Student Life, Betty Boyd, B.A.
University Extension and Continuing Education, R. Rudy Filek, Ph.D.

Directors

Admissions and Records, Glenn G. Carter, Ed.D.
Air Force Aerospace Studies (ROTC), Col. John N. Sims, M.B.A.
Alumni Activities, Richard A. Polen, B.S.J.
Book Stores, John J. Porter, M.B.A.
Budget Office, Richard M. Gardner, M.B.A.
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Center for Women's Studies, Judith G. Stitzel, Ph.D.

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Computing Services, Floyd R. Crosby, Jr., B.S.B.Ad.
Controller, William A. McCune, M.B.A.
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Gerontology Center, Rick A. Briggs, M.A., *(Interim)*
Housing and Residence Life, Stephen S. Showers, M.Ed.
Human Resources, S. Thomas Serpento, M.A.
Institutional Analysis and Planning, Edwin R. Smith, Ed.D., *(Interim)*
Intercollegiate Athletics, Fred A. Schaus, M.S.
Internal Auditing, William R. Quigley, B.S., C.P.A.
Military Science (Army ROTC), Lt. Col. Ernest K. White, Jr., M.A.
Mountainlair, Daniel N. Adams, Ed.D.
Off-Campus Credit, Edsel Gainer, Ed.D.
Parking, Transportation, and Mail Service, Robert J. Bates, B.S.M.E.
Physical Plant, Dorsey D. Jacobs
Public Safety, William S. Strader, B.A.
Purchasing, Garry W. Hersman, B.S.
Regional Research Institute, Andrew M. Isserman, Ph.D.
Sponsored Programs, William W. Reeves, M.P.A.
Student Activities and Educational Programs, Robert F. McWhorter, M.S.
Student Financial Aid, Neil E. Bolyard, M.A.
Summer Sessions, Martha C. Howard, M.A.
University Honors Program, Martha C. Howard, M.A.

Distinguished Professors

Franklin D. Cleckley, J.D., *Arthur B. Hodges Professor of Law.*
Bernard R. Cooper, Ph.D., *Claude Worthington Benedum Professor of Physics.*
Edmund B. Flink, M.D., Ph.D., *Claude Worthington Benedum Professor of Medicine.*
Gabor B. Fodor, Ph.D., *Centennial Professor of Chemistry.*
Ruel E. Foster, Ph.D., *Claude Worthington Benedum Professor of American Literature.*
Frank Gagliano, M.F.A., *Claude Worthington Benedum Professor of Theatre.*
George A. Hedge, Ph.D., *Edward J. Van Liere Professor of Physiology.*
Jay H. Kelley, Ph.D., *Distinguished Professor of Mineral and Energy Resources.*
C. Lawrence Kien, Ph.D., *Professor, Charles E. (Jim) Compton Chair of Nutrition.*
Thomas P. Meloy, Ph.D., *Claude Worthington Benedum Professor of Mineral Processing.*
William H. Miernyk, Ph.D., *Claude Worthington Benedum Professor of Economics.*
Franklin Parker, Ed.D., *Claude Worthington Benedum Professor of Education.*
Hayne W. Reese, Ph.D., *Centennial Professor of Psychology.*
Inez Smith Reid, Ph.D., *William J. Maier, Jr. Visiting Professor of Law.*
Martin W. Schein, Sc.D., *Centennial Professor of Biology.*
George W. Weinstein, M.D., *Professor, Jane McDermott Shott Chair of Ophthalmology.*

Part 1
GENERAL INFORMATION

West Virginia University combines many of the advantages of both a large and small institution. It is a comprehensive university offering 175 degree programs from the bachelor's through the doctoral level. But it is decentralized in 15 colleges and schools on two campuses in Morgantown, which helps maintain the friendly, informal atmosphere of smaller institutions.

With 19,000 students and 1,307 faculty, WVU is large enough to support academic diversity (more than 3,800 courses are offered). WVU students come from all 55 West Virginia counties, 48 other states, and 79 foreign countries. One of the University's proudest traditions is sending 20 Rhodes Scholars to Oxford University in England. WVU freshman students score well in the American College Testing Program—20.5 compared to 18.9 nationally (1984).

West Virginia University is one of only 24 state universities in the nation that serve as both the comprehensive and land-grant institutions in their states. They are called land-grant institutions (there are 72) because the Congressional act establishing them in 1862 gave federally owned land to each state that then sold the land and used the funds to begin a college offering programs in agriculture and engineering.

Since its founding in 1867, WVU has developed into the center of graduate and professional education, research, and extension programs in West Virginia. Coal and energy are a major focus of University research because of WVU's location in the heart of the eastern coal fields.

The Personal Rapid Transit (PRT) System, which was built by the U.S. Department of Transportation as a national research and demonstration project, connects downtown Morgantown and the campuses. The PRT, perhaps the largest research and demonstration project ever built on a university campus, consists of computer-directed, electric-powered cars that operate on a concrete-and-steel guideway without drivers on board.

The Morgantown campuses contain 121 buildings on 799 acres, valued at $348 million; libraries with 1,056,016 books, 920,513 microforms and microfilms, and 9,000 periodicals; and five computer sites utilizing an IBM 3081D-GX3, four DEC VAX 11/780s, and a DEC PDP 11/44.

Branches include the Charleston Division of the WVU Medical Center; Wheeling Division of the School of Medicine; Potomac State College at Keyser, the state's only residential junior college; and five off-campus graduate centers at Jackson's Mill near Weston, in Parkersburg, at Potomac State College, Shepherd College in the Eastern Panhandle, and West Liberty State College in the Northern Panhandle.

West Virginia University is a member of the North Central Association of Colleges and Schools. The University's educational programs are accredited by the North Central Association and by the appropriate accreditation agencies for professional programs.

West Virginia University operates eight experiment farms in Hardy, Jefferson, Monongalia, Monroe, and Preston counties; four experiment forests in Monongalia, Preston, Randolph, and Wetzel counties; a geology camp in Greenbrier County; and the State 4-H Camp and a museum of mid-nineteenth century life at Jackson's Mill, the boyhood home of Confederate General Stonewall Jackson that has been entered in the National Register of Historic Places.

Potomac State College's transfer programs, designed to conform to the WVU lower division, provide the freshman and sophomore years in the liberal arts and sciences as well as pre-professional studies in agriculture, business and economics, computer science, dentistry, education, engineering, engineering of mines, forestry, journalism, law, medical technology, medicine, music, nursing, pharmacy, physical education, physical therapy, social work, and veterinary medicine. Occupational programs at Potomac State College, which lead to the Associate in Applied Science degree, include: general business, accounting, industrial management, small business administration, agriculture, computer programming, engineering technology, horticulture technology, and secretarial studies. Certificate programs are offered in surveying technology assistant and computer equipment operations.

Government and Organization of WVU

The *West Virginia Board of Regents* is vested by law with the authority for the control and management of the University and all other state institutions of higher education. Serving on the Board are nine members appointed by the Governor, with advice and consent of the Senate, and four ex officio members including a faculty member chosen by the Regents' Advisory Council of Faculty, a staff member representing the Regents' Advisory Council of Classified Staff, and a student named by the Regents' Advisory Council of Students, all of whom vote, and the State Superintendent of Schools.

The president, appointed by the Board of Regents, is the chief executive officer of the University.

The University's 11-member Board of Advisors reviews all WVU proposals involving its mission, academic programs, budget, capital facilities, institution-wide personnel policies, and other matters requested by the president. The Board of Advisors also serves as the search and screening committee for new university presidents under guidelines established by the Board of Regents (in this role, the Board appoints three additional WVU faculty and the Regents appoint three additional members to comprise a 17-member committee).

The *Faculty Senate* is the vehicle for faculty participation in the governance of the University. It is a legislative body with original jurisdiction over all matters of academic interest and educational policy that concern the entire University or affect more than one college or school. The Senate's decisions are subject to review and approval by the president and the Board of Regents. Senators are elected by members of the University faculty to represent their colleges and other constituencies. Each constituency is entitled to one senator for each twenty constituents who are members of the University faculty. The Senate normally meets the second Monday of each month.

The Senate elects a faculty chair each year to preside over the meetings of the Senate and its Executive Committee. Three faculty members also serve on the Vice Presidents' Advisory Committee for Promotion and Tenure.

The President meets regularly with the Cabinet, which is comprised of the vice presidents, the executive officer, and the associate vice presidents for academic affairs and research and for university extension and public service. The President meets monthly with the Faculty Senate Executive Committee, the Staff Council, and Student Administration.

The *University Faculty Assembly* includes the president as presiding officer, vice presidents, academic deans, associate deans, professors, associate professors, assistant professors, and instructors holding appointments on a full-time basis. The assembly meets once a year in April.

West Virginia University also has a tradition of strong *Student Administration* that touches all aspects of student life and represents student opinion to the administration and faculty. Student Administration has three main units: the Executive Branch; the 11-member Board of Governors; and the Judicial Board. Students also serve on University-wide committees and the Mountainlair Advisory Council.

For non-teaching employees, there is the *Staff Council*, which consists of twelve members elected by their fellow employees in six occupational groups; and Laborers' International Union Local 814, AFL-CIO, which represents many employees.

Morgantown Area

Greater Morgantown has a population of 45,000; Monongalia County, 77,000. Monongalia County is one of the largest deep-mine, coal-producing counties in the nation. WVU is the largest single employer.

Located on the east bank of the Monongahela River, which flows north to nearby Pittsburgh, Morgantown is situated on rugged terrain of the Appalachian highlands. The altitude of the city varies from 800 to 1,150 feet above sea level, and the surrounding hills rise eastward to Chestnut Ridge to reach an altitude of 2,600 feet just ten miles from the city. Pittsburgh, ranked as the nation's "most liveable city," is only 73 miles from Morgantown.

The area's temperate climate is marked by four distinct seasons of about equal length. Morgantown averages 40 inches of precipitation a year. Rainy days are fairly common. Falls are beautiful with the hills turning red, orange, and yellow as the leaves change color.

A north-south interstate highway, I-79, is one mile west of Morgantown. U.S. 19 and U.S. 119 pass through Morgantown in the north-south direction. U.S. 48—a four-lane, east-west highway—ties I-79 and I-81 together between Morgantown and the Cumberland-Hagerstown, Maryland, region.

Because of WVU's intellectual resources, the Morgantown area is a major research center in the Appalachian region. Four federal agencies have research facilities in the area—Department of Health and Human Services (Appalachian Laboratory for Occupational Safety and Health), Forest Service (Forestry Sciences Laboratory), Morgantown Energy Technology Center of the U.S. Department of Energy, and Soil Conservation Service (West Virginia headquarters).

Two installations add to the area's variety. They are the Robert F. Kennedy Youth Center, a model federal prison; and an earth tracking station of the Communications Satellite Corporation (COMSAT) at Etam in neighboring Preston County (the station sends and receives world-wide telephone and other communications from satellites in outer space).

Housing and Residence Life

Of the 17,000 students enrolled on the Morgantown campuses, 3,415 are housed in the five University-owned residence halls and 500 married students and single graduate students live in University apartments. Approximately 2,500 students live in privately owned residence halls and fraternity and sorority hourses; 2,000 commute from their parents' homes; and 8,400 in apartments, mobile homes and private rooms.

The University Housing and Residence Life Office, G-18 Towers (phone 304/293-2811), provides information concerning University-owned housing. The Student Life Office in Moore Hall provides information concerning privately owned, off-campus housing (phone 304/293-5611).

Listings for privately owned rentals change daily so students should visit the Office of Student Life to see what is available and make their own arrangements with landlords. Students are encouraged to select quality student housing accommodations.

Because of the hilly terrain, parking is limited on the WVU campuses and in the city.

Nonacademic policies and regulations affecting students are summarized in the *Student Handbook*. Students are urged to obtain a copy of the *Student Handbook* from the Division of Student Affairs, 205 Moore Hall.

Part 2
ADMISSIONS, FEES, AND EXPENSES

Admissions

Admission to West Virginia University is governed by policies established by the WVU Faculty Senate, the University administration, and the West Virginia Board of Regents. Specific applications of these policies may vary from year to year following general policies:

1. The primary responsibility of the University is to the residents of West Virginia. Consequently, preference will be given to West Virginia residents in various admission processes.
2. Within the space available in a particular program, admissions will be offered preferentially to those whose performance record indicates the highest probability of success in the chosen program.
3. Where space is not available in a particular program, minimum program or college admission requirements have not been met or when students have not yet decided on a major, admission in the General Studies category may be offered (see page 31 for description).
4. Recognizing the need to accommodate certain students who would not otherwise qualify for admission, WVU may permit up to 5 percent of the admissions class based on the previous year's class to be admitted under an individual admission category. Students who have exhibited exceptional aptitude or talent, e.g., art, music, writing, dramatics, or athletics as well as the educationally disadvantaged will be considered.

Admission of Freshman Students

West Virginia high school students may obtain applications for admission from their high schools or by contacting the Office of Admissions and Records (Box 6009, Morgantown, WV 26506-6009; telephone 304/293-2121). Out-of-state students should write to the WVU Office of Admissions and Records and request an application form. Applicants must complete their part of the application and then return it to their school. The school should send the completed application, an official transcript of the student's high school grades, and the course list for the senior year (if applicable) directly to the WVU Office of Admissions and Records. All applications must include an official transcript from an accredited high school.

All students are required to take the American College Testing Program (ACT) tests or the Scholastic Aptitude Test (SAT) and have the report of scores sent to WVU prior to the admission decision. Students admitted on the basis of SAT scores must submit results of the ACT by the end of the first semester of their freshman year.

General Credit Requirements

To be considered for admission to WVU, an applicant is required to present the following high school credits:

English—4 units.
Biology—1 unit.
Social Studies—3 units.

Mathematics—2 units of college preparatory mathematics, one of which must be algebra (all students), (2 units of algebra and 1 unit of geometry *for students wishing to enter any program requiring a specific mathematics course for graduation*).

Electives—8 additional units chosen from the areas of fine arts, science, mathematics, computer science, foreign languages, and communication. No later than the Fall of 1990, 1 more unit of a laboratory science will also be required.

Students wishing to enhance their chances for academic success at WVU should choose these elective units so as to provide additional preparation for the chosen field of study.

Grade-Point Average (GPA); Test Score Requirements; GED Diplomas

For freshman admission, performance is measured by high school grade-point average and ACT or SAT test results.

High school seniors who rank in the upper 5 percent of their graduating class, have an ACT composite score of at least 28 (or SAT equivalent), or are National Merit Semifinalists will be admitted without regard to residence.

The following are *minimum* requirements. Selected programs may require substantially higher grade-point average and/or test results.

West Virginia Residents

West Virginia residents who satisfy the General Credit Requirements (above) and have at least a 2.0 high school grade-point average *and* a composite American College Testing (ACT) program score of at least 16 (or SAT score of 740) *will be admitted.* West Virginia residents who satisfy the General Credit Requirements and have *either* a 2.0 high school grade-point average or composite ACT score of at least 16 (or 740 combined SAT) *will be considered* on an individual basis by the Admission Review Committee.

Nonresidents

Nonresidents who satisfy the General Credit Requirements (above) and have at least a 2.25 high school grade-point average *and* a composite ACT score of at least 18 (SAT total score of 800) *will be admitted.* Nonresidents who satisfy the General Credit Requirements and have a 2.25 high school grade-point average *or* a composite ACT of at least 18 (or 800 SAT) *will be considered* on an individual basis by the Admission Review Committee.

GED Diplomas

GED diplomas are acceptable for admission consideration. Students who have received a GED diploma less than five years prior to seeking admission to WVU will have to meet ACT and course requirements for admission.

Admission of Transfer Students

Admission as a transfer student is available to those students who present evidence of 12 transferable credit hours or more from an accredited post-secondary institution. Applicants with fewer than 12 transferable hours of credit must apply for freshman admission. All applicants with fewer than 29 transferable credit hours are ranked as freshmen and must submit ACT scores and high school transcripts as part of their applications.

Students wishing to transfer with more than 58 hours of transferable credit should be admissible to a specific degree-granting program within the

University before formal admission is granted. Individual consideration will be given to a limited number of students with more than 58 transferable hours who do not meet specific major requirements.

Acceptance of students with 58 or fewer transfer credit hours into some areas, e.g., engineering, pre-business and economics, and pre-computer science, will be determined by the number of available positions as well as the academic credentials of the student.

To be eligible to enroll as a transfer student at WVU, any student—regardless of residence—must present a minimum grade-point average of 2.0 in all college work attempted. *Some individual programs, however, have higher grade-point average requirements.*

Applicants for transfer from another college or university must submit to the Office of Admissions and Records a complete application for undergraduate admission and an official transcript of all college work attempted to date at least two months prior to the semester for which the applicant requests admission. An official transcript covering subjects subsequently taken must be sent before final admission is granted.

A complete application must include Catalog pages from the institution attended describing all subjects which have been or will have been completed. The applicant's name should be written on each page and each subject must be indicated by a check mark in the margin. Complete catalogs should not be sent. (Catalog pages describing courses taken at West Virginia Board of Regents institutions need not be submitted.)

Credits and grades for all baccalaureate-level courses at any baccalaureate degree-granting institution in the West Virginia state system of higher education may be transferable toward a bachelor's degree, if appropriate to that degree. No more than 72 hours of credits and grades earned for college-parallel courses completed at community colleges or branch colleges in the West Virginia state system may be transferable toward a bachelor's degree.

Credits (though not grades) are transferable from institutions outside the West Virginia state system for courses carrying a grade of C or higher, if appropriate to the degree

Credits from two-year community colleges and junior colleges outside the West Virginia state system are limited to 72 hours of lower-division courses. These colleges must be accredited by the North Central Association of Colleges and Schools or other regional accrediting associations.

The transfer of credits does not exempt the student from satisfying all the requirements for the student's degree program at WVU.

Evaluation of transcripts for transfer of credit is furnished only after receipt of complete official transcripts, provisional admission to WVU, and payment of a $40.00 advanced tuition deposit. Therefore, a complete application and all transcripts must be in the Office of Admissions and Records two months in advance of registration.

Intrauniversity Transfers

Students transferring from Potomac State College of WVU shall be considered intrauniversity transfers. Students will be eligible to transfer as long as they can be considered students in good standing at WVU. All records made at Potomac State College are part of the student's WVU record, but no more than 72 hours of credits may be applied toward the baccalaureate degree. Students desiring to enter a specific degree-granting program will have to meet all of the program's requirements.

Admission of Post-Baccalaureate Students

Students possessing one or more earned degrees from an approved college or university and desiring to enroll for undergraduate credit may be admitted as post-baccalaureate students. Students admitted in this category would not be working toward a graduate degree and credit earned while under this classification would be limited to undergraduate credit. Students admitted as post-baccalaureate, since they are limited to undergraduate credit, would be assessed undergraduate fees. Candidates for admission to this classification who are not graduates of WVU must submit an official transcript from the institution granting their latest degree.

Second Bachelor's Degree

Persons desiring to obtain a second bachelor's degree must submit an undergraduate application. In general, admission will be granted on the basis of a cumulative grade-point average of 2.0 or better in their first bachelor's degree. Selected majors have higher requirements. (See page 34 for additional information.)

Admission of Special Students

Persons not desiring to become candidates for a degree may, by special permission, be admitted as special students. They are subject in all respects to the usual rules relating to admission, registration, and scholarship. Enrollment in any class is subject to the approval of the instructor in charge.

Transient Students

Students from other institutions who desire to take individual courses at WVU for transfer to their home institutions need only submit a statement of good standing from the home institution with the application form.

High School Specials

High school seniors desiring to take specific courses at WVU require permission from the high school and parents and a minimum 3.0 grade-point average. Registration is limited to 6 credit hours per semester.

Admission of International Students

West Virginia University is authorized under Federal law to enroll nonimmigrant alien students.

International students wishing to enroll in WVU must comply with the academic requirements stated above in addition to other academic and nonacademic requirements as follows.

Early Inquiry and Application—International applicants should forward a letter of inquiry one year before they intend to begin study in the United States. The University receives a large number of applications from international students. For this reason and because of the time required for the student to make visa and financial arrangements, April 1 has been established as a deadline after which applications cannot be processed.

International students should make all arrangements for their financial obligations to WVU and for their entire stay in the United States before leaving their country.

Because of the large number of applicants and limited openings available in WVU Medical Center programs, preference in admissions is given to qualified West Virginians although outstanding nonresident applicants will be considered. Careful consideration is given to those personal qualifications which bear upon fitness of applicants for the study and practice of the profession.

English Proficiency—All international applicants whose native language is not English must submit Test of English As a Foreign Language (TOEFL) scores. A minimum of 550 is required for admission. TOEFL information and registration forms are available from the Educational Testing Service, Princeton, NJ 08540 USA. Tests are normally given six times each year. It requires one month to score and report individual test results. Registration for the TOEFL examination closes five weeks before the testing date.

NOTE: In certain programs, provisional admission is possible for students with scores lower than 550 on the TOEFL. In such cases, students are admitted provisionally on the basis of their academic record, contingent upon submission of satisfactory TOEFL scores or satisfactory completion of the WVU Intensive English Program. For information about the Intensive English Program, contact the WVU Department of Foreign Languages, Chitwood Hall, Morgantown, WV 26506.

Credentials—Complete and original official records of all studies undertaken by an applicant at any institution attended (secondary school, college, university, technical school, professional school, etc.) must be provided at time of application for admission to WVU. Copies of original records are acceptable, provided they are officially stamped.

Such records should include: (1) complete dates of attendance; (2) identification of individual subjects; (3) total number of hours in each class per week; (4) total number of weeks each class meets in session; (5) final grade in each subject, for each year; (6) actual credits earned for each subject; (7) class, division, or rank achieved; (8) identification of the individual; (9) explanation of each institution's grading system; and (10) certification, and date, of degree or awards achieved. If any of this information cannot be supplied, an official explanatory statement from the school should be submitted. *(All documents must be accompanied by certified English translations.)*

All documents should be forwarded directly from the registrar or other authorized official of the school to the WVU Office of Admissions and Records, P.O. Box 6009, Morgantown, WV 26506-6009 USA.

If an applicant is currently enrolled in a school, tentative admission may be granted on the basis of an incomplete record which indicates the applicant will unquestionably meet the admission standards of WVU. Final admission, however, cannot be approved until the complete record has been received and evaluated.

International Students Transferring Within the United States—International students applying to transfer from schools within the United States will not be permitted to register at WVU unless they have complied with all transfer procedures as required by the United States Immigration and Naturalization Service (INS). Upon arrival on the campus the student must be prepared to present the I-20 ID to the International Student Adviser for signature.

No student should move to Morgantown without having received an assurance of admission from WVU.

Admission of Veterans

Veterans may be admitted to WVU with less than the minimum admission requirements necessary for other, nonveteran applicants.

Information regarding educational opportunities made possible at the University through provisions of the Veterans Readjustment Benefits Act of 1966—G.I. Bill (Public Law 358), the Vocational Rehabilitation Program of the Veterans Administration (Public Law 16), and the War Orphan's Educational Assistance Act of 1956 (Public Law 634) may be obtained from a financial aid counselor by personal conference at the Student Financial Aid Office in Mountainlair, or by mail (P.O. Box 6004, Morgantown, WV 26506-6004). An amendment to Public Law 634, enacted in 1964, provides benefits to many dependents of 100 percent disabled veterans.

Veterans having at least one continuous year of active military service may receive advanced placement credit for General Physical Education 1 and 2. Proof of such military service must be presented to the Director of Admissions and Records.

Because of the large number of applicants and limited openings available in WVU Medical Center programs, preference in admissions is given to qualified West Virginians although outstanding nonresident applicants will be considered. Careful consideration is given to those personal qualifications which bear upon fitness of applicants for the study and practice of the profession.

Readmission

Undergraduate students who leave the University for at least one complete semester are required to submit an application for readmission to the Office of Admissions and Records. Decisions on readmission will be based on the student's WVU record together with that of any other institution the student might have attended after leaving WVU. Students remaining in good standing on a combination of those records are eligible for readmission.

Students who have been suspended from the University must have written approval from the dean of the school or college to which they desire to be admitted before an application for readmission is submitted.

Some students are unsuccessful in their initial higher education experience resulting in very poor grades and/or academic suspension. If such a student has not been enrolled at a West Virginia Board of Regents institution for at least five calendar years and has not been enrolled in any other academic institution of higher learning during those five years, then the student may be eligible for readmission to WVU under the Academic Forgiveness Policy (see below.)

Students wishing to change their major upon readmission must have permission from their previous dean and the dean of the school or college to which they desire to be admitted.

Academic Forgiveness Policy

If a student has been out of residence at a West Virginia Board of Regents institution for at least five calendar years and has not been enrolled in any

other academic institution of higher learning during those five years, then the student may be eligible for admission to West Virginia University under the Academic Forgiveness Policy.

The conditions and rules of the Academic Forgiveness Policy are as follows:

1. Admission to WVU under the Academic Forgiveness Policy is conditional upon first meeting the above out-of-residence period. In addition, a recommendation that the student be admitted under the Academic Forgiveness Policy must be submitted by the dean of the college and school that the student plans to enter and the recommendation must be approved by the Office of the Provost and Vice-President for Academic Affairs and Research.
2. Upon admission to WVU under the Academic Forgiveness Policy, credit hours (only) will be utilized for those courses completed by the student during any prior enrollment period in which a grade of D or higher had been earned.
3. Grades earned during any prior enrollment period will not be counted for purposes of calculating the student's grade-point average while under the Academic Forgiveness Policy, but grades earned will remain on the student's permanent record.
4. The student must meet and complete all course work required to meet the college's or school's requirements for graduation, but under no circumstances after the student has been admitted under the Academic Forgiveness Policy shall the student complete fewer than 64 credit hours prior to earning his/her degree.
5. A student admitted to WVU under the Academic Forgiveness Policy will follow all regulations regarding probation, suspension, and expulsion.

Admission to Medical Center Programs

Applicants for admission to any of the schools of the WVU Medical Center should write to the Assistant Director of Admissions and Records, WVU Medical Center, Morgantown, WV 26506, requesting the appropriate application forms. (The *WVU Medical Center Catalog* has complete information for all Medical Center programs and is available at the Office of Admissions and Records.)

Because of the large number of applicants and limited openings available in WVU Medical Center programs, preference in admissions is given to qualified West Virginians although outstanding nonresident applicants will be considered. Careful consideration is given to those personal qualifications which bear upon fitness of applicants for the study and practice of the profession.

When requesting an application by letter for any of the Medical Center programs, the permanent home address must be given.

Dentistry and Medicine applications fees are $30.00. All other WVU medical science programs are $10.00 and must accompany the applications.

Any applicant who is refused admission, or who fails to enroll after acceptance, must re-apply in the regular manner if consideration for a subsequent year is desired.

Those applicants accepted for admission to any of the programs of the WVU Medical Center, except the Division of Dental Hygiene and out-of-state applicants to the School of Dentistry, are required to deposit $50.00 before acceptance becomes official. Applicants accepted to the Division of Dental

Hygiene deposit $40.00, and out-of-state applicants accepted to the School of Dentistry, deposit $100. If the applicant enrolls in the program of the applicant's choice, the deposit is applied to the first-semester tuition.

If an application for admission to the School of Medicine is withdrawn after the applicant has been offered a place and has submitted a deposit, such deposit may be refunded any time before March 30 of the year in which enrollment is anticipated, but will not be refunded after this date. Deposits submitted to all other programs are nonrefundable.

It is required that during the first semester of the first year all WVU Medical Center students must complete certain prescribed immunization and diagnostic procedures.

Fees and Expenses

Fee Regulations

All West Virginia University fees are subject to change without notice.

All fees are due and payable to the Controller on the days of registration. Students must pay fees before registration is accepted. Completion of arrangements with the Controller's Office for payment from officially accepted scholarships, loan funds, grants, or contracts shall be considered sufficient for acceptance of registration. Fees paid after regular registration must be paid to the University Cashier in Mountainlair.

All students are expected to register on days set apart for registration at the beginning of each semester or summer session of the University.

No student will be permitted to register at the University after the eighth day of a semester or the fourth calendar day of the summer sessions or a single summer session. Days are counted from the first day of registration.

Any student failing to complete registration on regular registration days is subject to the Late Registration Fee of $20.00.

Students registering pay the fees shown in the fees charts, plus special fees and deposits as required.

Financial Aid

Students interested in financial assistance must file a Financial Aid Form (FAF) with College Scholarship Service, Box 2700, Princeton, NJ 08540. Forms are available at high schools or from the College Scholarship Service or the WVU Financial Aid Office. Submit only forms dated for the current academic year.

Your Guide to Financial Aid—West Virginia University is available at the WVU Financial Aid Offices, Mountainlair, Downtown Campus, and 104 Basic Sciences Building, Medical Center. The guide describes available financial aid, application procedures, and estimated educational expenses for attending WVU.

Semester Fees in Colleges and Schools

(Subject to Change Without Notice.)

FULL-TIME[1]

Undergraduate[a,f]

Fee	Tuition	Registration	Higher Educotion Resources	Institutional Activity	Mountainlair Construction	Faculty Improvement	TOTAL
Resident	$130.00	$ 50.00	$ 180.00	$165.00[c]	$40.00	$15.00[d]	$ 580.00
Nonresident	500.00	250.00	565.00	$165.00[c]	40.00	50.00[d]	1,570.00

Graduate[b,f]

Resident	$160.00	$ 50.00	$ 180.00[e]	$165.00[c]	$40.00	$15.00[d]	$ 610.00
Nonresident	600.00	250.00	565.00[c]	$165.00[c]	40.00	50.00[d]	1,670.00

Dentistry[f]

Resident	$300.00	$ 50.00	$ 475.00[d]	$165.00[c]	$40.00	$15.00[d]	$1,045.00
Nonresident	800.00	250.00	1,090.00[d]	$165.00[c]	40.00	50.00[d]	2,395.00

Medicine[f,h]

Resident	$300.00	$ 50.00	$ 475.00[d]	$165.00[c]	$40.00	$15.00[d]	$1,195.00
Nonresident	800.00	250.00	1,090.00[d]	$165.00[c]	40.00	50.00[d]	2,545.00

[a]Undergraduate students enrolled for 12 or more credit hours pay maximum charges as indicated. Students enrolled for less than 12 credit hours pay a prorated charge calculated in direct proportion to the number of credit hours taken.

[b]Graduate students enrolled for 9 or more credit hours pay maximum charges as indicated. Students enrolled for less than 9 credit hours pay a prorated charge calculated in direct proportion to the number of credit hours taken.

"Graduate," for fee purposes, includes all graduate studies programs and the College of Law.

[c]Paid by Law and Graduate students only.

[d]Dental and Medical students pay appropriate laboratory and microscope fees.

[e]Includes Athletics Fee, $40.00; Student Affairs Fee, $20.00; Daily Athenaeum Fee, $2.50; Health, Counseling, and Program Services Fee, $55.00; Transportation Fee, $45.00; Radio Station Fee, $2.50.

[f]All part-time students enrolled for 7 or more credit hours must pay the Institutional Activity Fee and the Mountainlair Construction Fee.

[g]Faculty Improvement Fee will be charged to all students and will be prorated for part-time students.

[h]Includes $150 Medical Education Fee. (Prorated for part-time students.)

PART-TIME[2]

Tuition per semester hour	Resident	Nonresident
Undergraduate Students	$31.00	$114.00
Graduate Students	45.00	164.00
Dentistry and Medicine Students	93.00	244.00
Faculty Improvement Fee	Prorated[g]	Prorated[g]
Medical Education Fee	Prorated[h]	Prorated[h]

The minimum rate for noncredit courses is that charged for 1 semester hour of credit.

[1]A full-time graduate student is one who is registered for 9 or more semester hours of work each semester of the regular academic year, or 6 or more semester hours of work altogether during the summer.

A full-time undergraduate student is one who is registered for 12 or more semester hours work each semester of the regular academic year, or 6 or more semester hours of work during a 6-week summer session.

[2]For fee assessment purposes, a part-time graduate student is one who is registered for fewer than 9 semester hours per semester during the regular academic year, or for fewer than 6 semester hours during a 6-week summer session.

A part-time undergraduate student is one who is registered for fewer than 12 semester hours per semester during the regular academic year, or for fewer than 6 semester hours during a 6-week summer session.

ESTIMATED EXPENSES FOR MEDICAL CENTER PROGRAMS (First Semester)
[Subject to Change]

Tuition and registration are the same for both semesters. Some expenses, such as instruments and books, will be different for the Second Semester.

School or Division	Tuition and Registration Fees		Instruments	Lab Coats, Uniforms etc.	Books	Total	
	Resident	Nonresident				Resident	Nonresident
Dental Hygiene							
Freshmen	$ 580.00	$1,570.00	$ 150.00	$ 25.00	$210.00	$ 985.00	$1,955.00
Sophomore	580.00	1,570.00	850.00	185.00	210.00	1,825.00	2,815.00
Junior	580.00	1,570.00	260.00	100.00	230.00	1,170.00	2,160.00
Senior	580.00	1,570.00	100.00	100.00	210.00	990.00	1,980.00
Dentistry							
First Year	1,045.00	2,395.00	2,622.00	88.00	609.00	4,564.00	5,914.00
Second Year	1,045.00	2,395.00	501.00	110.00	167.00	1,823.00	3,173.00
Third Year	1,045.00	2,395.00	———	———	66.00	1,111.00	2,461.00
Fourth Year	1,045.00	2,395.00	———	———	———	1,045.00	2,395.00
Medical Technology							
Junior	580.00	1,570.00	40.00	85.00	139.00	844.00	1,834.00
Summer	125.00	291.00	———	220.00	268.00	613.00	779.00
Senior	580.00	1,570.00	———	185.00	———	765.00	1,755.00
Medicine							
First Year	1,195.00	2,545.00	450.00	100.00	300.00	2,045.00	3,395.00
Second Year	1,195.00	2,545.00	100.00	50.00	250.00	1,595.00	2,945.00
Third Year	1,195.00	2,545.00	———	50.00	200.00	1,445.00	2,795.00
Fourth Year	1,195.00	2,545.00	———	50.00	150.00	1,395.00	2,745.00
Nursing							
Sophomore	580.00	1,570.00	40.00	130.00	550.00	1,300.00	2,290.00
Summer	249.00	747.00	———	———	120.00	369.00	867.00
Junior	580.00	1,570.00	———	———	120.00	700.00	1,690.00
Senior	580.00	1,570.00	———	———	130.00	710.00	1,700.00
Pharmacy							
Third Year	580.00	1,570.00	48.00	30.00	260.00	916.00	1,908.00
Fourth Year	580.00	1,570.00	———	30.00	195.00	805.00	1,795.00
Summer	342.00	1,089.00	———	———	———	342.00	1,089.00
Fifth Year	580.00	1,570.00	———	30.00	75.00	685.00	1,675.00
Physical Therapy							
Junior	580.00	1,570.00	60.00	70.00	300.00	1,010.00	2,000.00
Senior	580.00	1,570.00	———	70.00	335.00	985.00	1,975.00
Summer	186.00	684.00	———	———	———	186.00	684.00

TUITION & REGISTRATION FEES BREAKDOWN		Tuition	Registration	Higher Education Resources	Institutional Activity	Mountainlair Construction	Faculty Improvement	Total
Dent. Hyg., Med. Tech., Nsg., Pharm., Phys. Ther. (Full-time: 12 hr. or more)	Resident	$130.00	$ 50.00	$ 160.00	$165.00	$40.00	$15.00	$ 580.00
	Nonresident	500.00	250.00	565.00	165.00	40.00	50.00	1,570.00
Graduate (Full-time: 9 hr. or more)	Resident	160.00	50.00	180.00	165.00	40.00	15.00	610.00
	Nonresident	600.00	250.00	565.00	165.00	40.00	50.00	1,670.00
Dentistry (Full-time: 9 hr. or more)	Resident	300.00	50.00	475.00	165.00	40.00	15.00	1,045.00
	Nonresident	800.00	250.00	1,090.00	165.00	40.00	50.00	2,395.00
Medicine (Full-time: 9 hr. or more)	Resident	300.00	50.00	475.00	165.00	40.00	15.00	1,195.00*
	Nonresident	800.00	250.00	1,090.00	165.00	40.00	50.00	2,545.00*

TUITION PER SEMESTER HOUR—PART-TIME & SUMMER (Under 9 hr.)	Resident	Nonresident
Dental Hygiene, Medical Technology, Nursing, Pharmacy, and Physical Therapy	$31.00—Per Credit Hour—	$114.00—plus Special Fees
Graduate	45.00—Per Credit Hour—	164.00—plus Special Fees
Dentistry	93.00—Per Credit Hour—	244.00—plus Special Fees
Medicine**	93.00—Per Credit Hour—	244.00—plus Special Fees

SEMESTER: $45.00—SPECIAL FEES—SUMMER: $17.00 under 6 hr. — $63.00 6 hr. or more each session

*Includes $150.00 Medical Education Fee.
**Plus Medical Education Fee prorated.

Fees for Off-Campus Courses

Fees for credit hours for off-campus students are the same as those charged students enrolled in on-campus courses. Off-campus students do not pay the Daily Athenaeum Fee, the Radio Station Fee, or the Mountainlair Construction Fee. However, all students must pay a $40.00 course fee for each off-campus course taken and the Faculty Improvement Fee.

Special Fees

Application for Undergraduate Admission (Freshman, Transfer and Foreign Students)	$10.00
Application for Admission (Dentistry and Medicine)	30.00
Application for Admission (College of Law or Graduate Studies)	20.00
Certificate of Advanced Study in Education	2.00
Diploma Replacement	20.00
Examination for Advanced Standing	35.00
Examination for Entrance Credit, per unit	1.00
Non-Enrolled Graduate Student Evaluation Fee (For graduate students not otherwise enrolled at time of final exam.)	50.00
General Educational Development Tests (high school level) (If the applicant applies for admission to and registers in WVU within twelve months of the date of qualifying for the test, a $10.00 credit shall be established for the applicant.)	15.00
Graduate Program Continuance Fee	35.00
Graduation (Payable by all students at the beginning of the semester or session in which they expect to receive their degrees.)	20.00
Late Registration (nonrefundable) (Not charged to students who complete registration during the regular registration days set forth in the University Calendar.)	20.00
Non-Enrolled Graduate Student Evaluation Fee (For graduate students not otherwise enrolled at time of final exam.)	50.00
Professional Engineering Degree (includes $20.00 Graduation Fee)	35.00
Reinstatement of Student Dropped from the Rolls	10.00
Student Identification Card Replacement	10.00
Student's Record Fee (One transcript of a student's record is furnished by the Office of Admissions and Records without charge. This fee is charged for furnishing an additional transcript.)	3.00

Laboratory Fees

Consult specific departmental sections of this *Catalog* concerning nonrefundable deposits and microscope rental fee.

Music Practice and Rental Fees

Practice Room Fee: All music majors must pay a fee of $10.00 per semester, which entitles them to assigned practice space one hour per day. Additional space may be available at the rate of $4.00 per hour.

Band and Orchestra Instruments: Rental, $10.00 per semester.

Summer Tuition and Fees

Tuition, per semester hour	Resident	Nonresident
Undergraduate students	$31.00	$114.00
Graduate students	45.00	164.00
Dentistry and Medicine students	93.00	244.00
Daily Athenaeum Fee*	1.00	1.00
Radio Station Fee*	1.00	1.00
Health, Counseling, and Program Services Fee	21.00	21.00
Mountainlair Construction Fee, per 6-week summer session or any portion thereof*	15.00	15.00
Student Affairs Fee	8.00	8.00
Transportation Fee	17.00	17.00

*Fee required of all students. (Nonrefundable unless student withdraws officially before the close of general registration.)

Service Charge on Returned Checks

A service charge of $10.00 will be collected on each check returned unpaid by the bank upon which it is drawn.

If the check returned by the bank was in payment of University and registration fees, the Controller's Office shall declare the fees unpaid and registration cancelled if the check has not been redeemed within three days from date of written notice. In such a case the student may be reinstated upon redemption of the check, the payment of the $10.00 service charge, the Reinstatement Fee of $10.00, and the Late Registration Fee of $20.00.

Non-Sufficient Funds Check Policy

Payments of tuition, fees, and other charges by check are subject to WVU's Non-Sufficient Funds Check Policy. A copy of this policy is available in the Bursar's Office.

Refund of Fees

A student who officially withdraws from University courses may arrange for a refund of fees by submitting to the University Controller evidence of eligibility for a refund.

To withdraw officially, a student must apply to the Division of Student Affairs for permission. Semester fees will be returned in accordance with the following schedule:

Academic Year (Semester)	*Refund*
During the first and second weeks	90%
During the third and fourth weeks	70%
During the fifth and sixth weeks	50%
Beginning with the seventh week	No Refund

Summer Sessions and Non-Traditional Periods

Refunds for summer sessions and non-traditional periods are established based upon the refund rate for the academic year. (For specific information concerning Summer Session refunds, see the appropriate Summer *Schedule of*

Courses.) Should the percentage calculation identify a partial day, the entire day will be included in the higher refund period.

No part of the Activity Fee is refundable unless the student withdraws from the University.

University policy provides that students called to the armed services of the United States may be granted full refund of refundable fees, but no credit, if the call comes before the end of the first three-fourths of the semester, and that full credit of courses be granted to persons called to the armed services of the United States if the call comes thereafter; provided, however that credit as described above will be granted only in those courses in which the student is maintaining a passing mark at the time of departure for military service. In the recording of final grades, for three-fourths of a semester or more, both passing and failing shall be shown on the student's permanent record.

Cost of an Academic Year's Work

The Student Financial Aid Office estimates that the total cost of attending WVU for a nine-month academic year is $6,000 for single West Virginia residents living on or off-campus and $3,500 for those living at home; $8,000 for single nonresidents living on or off-campus and $5,500 for those living at home.

These typical estimated student budgets include tuition and fees, books and supplies, room, board, transportation, and personal expenses that provide for a modest but adequate life-style.

Identification Card

An identification card is issued to each full-time student upon paying full fees. It entitles the owner admission to certain University athletic events, various activities of student administration, Health Service, and Mountainlair. Confiscation will result from misuse. The University reserves the right to refuse reissuance of an identification card.

Residential Status for Admission and Fee Purposes

The West Virginia Board of Regents has adopted a policy regarding classification of students as residents or nonresidents for admission and fee purposes.

1. *General.* Students enrolling in a West Virginia public institution of higher education shall be classified as resident or nonresident for admission, tuition, and fee purposes by the institutional officer designated by the President. (At West Virginia University, the Director of Admissions and Records.) The decision shall be based upon information furnished by the student and all other relevant information. The Director of Admissions and Records is authorized to require such written documents, affidavits, verifications, or other evidence as are deemed necessary to establish the domicile of a student. The burden of establishing residency for admission, tuition, and fee purposes is upon the student.

If there is a question as to residence, the matter must be brought to the attention of the Director of Admissions and Records at least two weeks prior to the deadline for the payment of tuition and fees. Any student found to have made a false or misleading statement concerning residence shall be subject to institutional disciplinary action and will be charged the nonresident fees for each academic term theretofore attended.

2. *Residence Determined by Domicile.* Domicile within the State means adoption of the State as the fixed permanent home and involves personal residence within the State with no intent on the part of the applicant or, in the case of the dependent student, the applicant's parent(s) to return to another state or country. Residing with relatives (other than parent(s)/legal guardian) does not, in and of itself, cause the student to attain residence in this State for admission or fee payment purposes. West Virginia domicile may be established upon the completion of at least twelve months of continued residence within the State prior to the date of registration, provided that such twelve months residency is not primarily for the purpose of attendance at any institution of higher education in West Virginia.

Establishment of West Virginia domicile with less than twelve months residence prior to the date of registration must be supported by evidence of positive and unequivocal action. Priority consideration should normally be given to such evidence as the purchase of a West Virginia home, full-time employment within the State, paying West Virginia property tax, filing West Virginia income tax returns, registering of motor vehicles in West Virginia, and marriage to a West Virginia resident. Items of lesser importance which might be considered as support factors include registering to vote in West Virginia and the actual exercise of such right, possessing a valid West Virginia driver's license, transferring or establishing local church membership, involvement in local community activities, and various other acts which may give evidence of intent to remain indefinitely within the State. Proof of a number of these actions shall be considered only as evidence which may be used in determining whether or not a domicile has been established. Factors militating against the establishment of West Virginia residency might include such considerations as the student not being self-supporting, being claimed as a dependent on federal or state income tax returns or the parents' health insurance policy if the parents reside out of state, receiving financial assistance from state student aid programs in other states, and leaving the State when school is not in session.

3. *Dependency Status.* A dependent student is one who is listed as a dependent on the federal or state income tax return of his/her parent(s) or legal guardian or who receives major financial support from that person. Such a student maintains the same residency as that of the parent(s) or legal guardian. In the event the parents are divorced or legally separated, the dependent student takes the residence of the parent with whom he/she lives or to whom he/she has been assigned by court order. However, a dependent student who enrolls and is properly classified as a resident student maintains that classification as long as the enrollment is continuous and that student does not attain independence and establish domicile in another state.

A nonresident student who becomes independent while a student at an institution of higher education in West Virginia does not, by reason of such independence alone, attain residence in this State for admission or fee payment purposes.

4. *Change of Residence.* A student who has been classified as an out-of-state resident and who seeks resident status in West Virginia must assume the burden of providing conclusive evidence that he/she has established domicile in West Virginia with the intention of making the permanent home in this State. The intent to remain indefinitely in West Virginia is evidenced not only by a person's statements but also by that person's actions. In making a determination regarding a request for change in residency status, the Director

of Admissions and Records shall consider those actions referenced in Section 2 above.

5. *Military.* An individual who is on full-time active military service in another state or a foreign country or an employee of the federal government shall be classified as a resident for the purpose of payment of tuition and fees, provided that the person established a domicile in West Virginia prior to entrance into federal service, entered the federal service from West Virginia, and has at no time while in federal service claimed or established a domicile in another state. Sworn statements attesting to these conditions may be required. The spouse and dependent children of such individuals shall also be classified as residents of the State of West Virginia for tuition and fee purposes.

Persons assigned to full-time active military service in West Virginia and residing in the State shall be classified as in-state residents for tuition and fee purposes. The spouse and dependent children of such individuals shall also be classified as residents of the State of West Virginia for tuition and fee purposes.

6. *Aliens.* An alien who is in the United States on a resident visa or who has filed a petition for naturalization in the naturalization court, and who has established a bona fide domicile in West Virginia as defined in Section 2 may be eligible for resident classification, provided that person is in the State for purposes other than to attempt to qualify for residency status as a student.

7. *Appeal Process.* The decisions of the Director of Admissions and Records may be appealed to the President of West Virginia University. The President may establish such committees and procedures as are determined to be appropriate for the processing of appeals. The decision of the President of West Virginia University may be appealed in writing with supporting documentation to the West Virginia Board of Regents in accord with such procedures as may be prescribed from time to time by the Board.

Part 3
ACADEMIC INFORMATION
Regulations Affecting Degrees

All degrees are conferred by the Board of Regents upon recommendation of the faculties of the various colleges and schools. Degrees are granted at the close of the semester or summer session in which the students complete their work.

Candidates for degrees are eligible for graduation when they complete the requirements in the college or school in which they are registered which were in effect at the time of their first registration in that college or school, provided they graduate within a period of seven years from the time of their first registration. Students who do not complete the requirements for graduation within seven years from their first registration must meet *all the conditions of a later Catalog*—one that will be no more than seven years old by the time they graduate.

If there are major changes in the *Undergraduate Catalog* during the student's course of study, the student does not have to abide by them unless they are promulgated by the Board of Regents, or by local, state, or federal law. However, by choice and with the approval of the adviser and the dean, a student may meet *all the conditions* of a later *Undergraduate Catalog* than that under which the student first registered in that college or school.

All candidates for degrees at WVU must report to their academic advisers and fill out an "Application for Graduation and Diploma." Application must be made during the first month of the semester or session in which the candidate expects to be graduated.

University policy provides that in view of public and professional responsibilities, the faculty of each of the professional schools of WVU has the authority to recommend to the President of WVU the removal of any student from its rolls whenever, by formal decision reduced to writing, the faculty finds that the student is unfit to meet the qualifications and responsibilities of the profession.

No degree will be conferred upon any candidate and no transcripts will be issued to any student before payment is made of all tuition, fees, and other indebtedness to any unit of the University.

Baccalaureate Degrees
Credits Required

In addition to the University requirements listed in this *Catalog*, each baccalaureate degree is conditional upon the completion of a specified number of semester hours of credit, as determined by the student's degree program requirements. Therefore, students must familiarize themselves with their school and degree program requirements, as given in Part 4 of this *Catalog*.

English Composition and Rhetoric

Two semesters of English Composition and Rhetoric (English 1 and 2) are required of all candidates for the bachelor's degree in all colleges and schools

of the University, unless part or all of the requirement for certain students of superior achievement is waived under regulations prevailing at the time of admission. Such students will be informed of their eligibility by the Coordinator of Writing Programs in English.

University Core Curriculum

[*Note:* At the time this *Catalog* went to press, the WVU Faculty Senate was considering major changes in the University Core Curriculum. Students are urged to consult with their advisers to determine the effect of the changes on their programs of study. The new core curriculum program will be titled Liberal Studies Program (LSP).]

To qualify for graduation, all WVU students must satisfy the requirements of the University Core Curriculum. The separate colleges and schools determine the time at which students take core courses during their total program of study at the University.

The purpose of the University Core Curriculum is to encourage the acquisition of a liberal education. A liberal education presupposes the capacity for synthesizing knowledge of the humanities, social sciences, natural sciences, and mathematics. Such a synthesis of both past and contemporary knowledge can make possible the intellectual flexibility needed to develop values, attitudes, tastes, and traits associated with the educated person in the modern world.

Three areas within the University Core Curriculum are recognized: *Core A* (the study of the accumulated knowledge and experience contained in world literature, fine arts, religion, and philosophy); *Core B* (the study of man's interaction with man and with society in the social, historical, political, economic, and similar contexts); and *Core C* (the study of mathematical and natural sciences designed to foster individual acquisition of knowledge and skills necessary for scientific inquiry).

Twelve credit hours including at least two subjects must be taken in each area. (Two 4-credit courses and one 3-credit course may be substituted in lieu of 12 credit hours.)

The determination as to whether ROTC courses will be counted toward fulfillment of the University Core Curriculum or will be counted as free electives is the prerogative of the department chairperson or dean of the appropriate college or school.

Core A Courses:

Art (Art) 3, 30, 100, 105, 106, 200.

English (Engl.) 21-22, 24-25, 35-36, 40, 45, 80, 85, 101-104, 106, 108, 111-113, 125, 130-134, 141, 143, 145, 150, 170-172, 175, 178, 180-181, 183, 186, 188, 191, 197, 201-202, 208, 210-211, 220, 223, 232-233, 235-236, 240-241, 245, 250, 255-256, 261-268, 280, 283, 288, 290, 294.

Foreign Languages:

Chinese (Chin.) 191.

Classics (Class.) 1-4, 11-14, 101-102, 109-110, 113, 165, 192.

Foreign Literature in Translation (FLIT) 13-18, 111-112, 121-122, 131-132, 141-142, 151-152, 155, 161-162, 171, 181-182, 191-192.

French (Fr.) 1-4, 10-11, 21-24, 33-34, 101-104, 109-112, 115, 118.

German (Ger.) 1-4, 10-11, 23-24, 33-34, 103-104, 109-112, 121-122, 131, 191.

Hebrew (Hebrw.) 1-4, 191.

Italian (Ital.) 1-4, 109-110, 191.

Japanese (Japan.) 191.
Linguistics (Lingu.) 1-3, 111.
Polish (Polsh.) 1-2.
Portuguese (Port.) 1-4.
Russian (Russ.) 1-4, 103-106, 109-110, 144-145.
Spanish (Span.) 1-4, 10-11, 23-24, 33-34, 103-104, 109-110, 116-118, 121-122, 191.
Humanities (Hum.) 1-5, 10-11, 191, 290.
Multidisciplinary Studies (MDS) 40, 90, 91, 92.
Music (Music) 19, 30-31, 33-34, 61-68, 100, 102-103, 105, 110, 113, 115, 129-130, 135-138, 160, 171-172, 174, 200, 213, 218-219, 221-225, 230, 239, 243, 260, 263-268, 299.
Philosophy (Phil.) 1-292 (except Phil. 190).
Religious Studies (Relig.) 5-150, 197.
Speech Communication (Spch.) 11-14, 21, 80, 105-109, 111, 131, 133, 161, 180, 187, 191, 206, 221, 230-231.
Theatre (Theat.) 30, 50, 74, 95, 106, 180, 200, 220-221, 251, 282, 290-291, 295-298.
Women's Studies (Wm. St.) 40.

Core B Courses:

Child Development and Family Studies (CD&FS) 10, 12, 110.
Economics (Econ.) 51, 54-55, 110, 130, 160, 200, 211-213, 216, 241, 245-246, 250, 255, 257, 262-263, 270, 279.
Education Foundations (Ed. F.) 1.
Forestry (For.) 140.
Geography (Geog.) 1, 7-8, 105, 107, 109-110, 140-141, 143-145, 150, 200-202, 205, 209, 215, 235.
History (Hist.) 1-290.
Mineral Resource Economics (M.E.R.) 97.
Multidisciplinary Studies (MDS) 2, 40, 50, 60, 70, 90, 91, 92, 250. Note: MDS 80, "Special Topics," when offered as "Labor in America," may also be credited to Core B.
Political Science (Pol. S.) 1-279. (Note: Pol. S. 188-189, 191, 195-196, and 200 **are not** core courses.)
Psychology (Psych.) 1-282 (except Psych. 25, 190, 194, 213).
Sociology and Anthropology (Soc. & A.) 1, 5, 51, 102, 121-123, 125, 131-133, 135-136, 138, 140, 145, 151-153, 156-160, 201-202, 204-205, 222, 232-233, 240, 255, 260-262.
Sport and Exercise Studies (S.E.S.) 71.
Technology Education (T.E.) 280-281.
Women's Studies (Wm. St.) 40.

Core C Courses:

Agricultural Microbiology (Ag. Bi.) 141, 201.
Animal Nutrition (An. Nu.) 101.
Animal Physiology (An. Ph.) 100, 225, 256, 280.
Biology (Biol.) 1-271.
Chemistry (Chem.) 10-250.
Computer Science (C.S.). All Computer Science courses, except those numbered 190-197, qualify for Core C; however, the only undergraduate Computer Science courses open to non-majors are C.S. 5 and C.S. 60.

Economics (Econ.) 125, 220, 225.
Entomology (Ento.) 152, 204, 210, 212.
Genetics (Gen.) 171, 290.
Geology (Geol.) 1-4, 7.
Mathematics (Math.) 3-292.
Multidisciplinary Studies (MDS) 2, 60, 70, 90, 91, 92.
Nutrition (Nutrn.) 71.
Physical Science (P. Sci.) 1-2, 11-12.
Physics (Phys.) 1-283; Astronomy (Astro.) 106, 216, 267.
Statistics (Stat.) 101, 201-291.

Academic Advising and General Studies Status

Students admitted to programs in the Colleges of Agriculture and Forestry, Creative Arts, Engineering, Mineral and Energy Resources, the School of Physical Education, and the Division of Dental Hygiene may enroll directly in the appropriate degree program and be assigned an academic adviser from the respective college or school.

The Colleges of Arts and Sciences and Human Resources and Education and the School of Social Work admit students to pre-programs in their majors. Students are assigned special academic advisers who will help them until they fulfill all requirements for admission to a degree program.

Other students may begin their work in one of the University's pre-programs, e.g. pre-Business and Economics, pre-Journalism, pre-Medical Technology, pre-Nursing, pre-Pharmacy, and pre-Physical Therapy. Normally, completion of 30-68 credits and a specific curriculum are required before admission to a degree program is granted. Students enrolled in these pre-programs are advised in the University Advising Center, where full-time professional advisers are available in each of these areas.

Students who are undecided about their major may enroll in General Studies. This possibility provides the undergraduate student with an opportunity to explore several career and academic program options before selecting a specific major or program of study. While examining options, students will enroll in courses that fulfill University requirements for graduation and provide a solid liberal arts foundation. A student may remain in General Studies through four semesters of college course work or until admitted to a degree program. Students selecting General Studies will be advised in the University Advising Center. Advising Center staff also provide services to part-time and special (non-degree) students.

Transfer of Credits

(See "Admission of Transfer Students," pages 14-15.)

West Virginia University students wishing to take courses at other institutions must seek advanced approval in writing. A cumulative average of C is required in order to obtain such approval. Credit will be accepted for transfer for courses carrying a grade of C or higher when the conditions indicated above have been met. (See "Work Done Out of Residence," below.)

Branch, Community, and Junior Colleges

Seventy-two hours of credits and grades earned for college-parallel courses completed at community colleges or branch colleges in the West

Virginia system of higher education may be applied toward a baccalaureate degree at WVU. Transfer credit for college-parallel courses completed at other community colleges and junior colleges may not exceed 72 hours. Transfer credit from community colleges and junior colleges is normally limited to lower-division courses.

Requirements As to Residence

A student who comes to WVU from another college or university should transfer no later than the beginning of the third year. In no case will a student who matriculates in WVU later than October 1 in any year be permitted to receive a degree at the next commencement.

In special cases, students who desire to leave WVU at the close of their third year to enter another institution for the purpose of taking a combined course leading to two degrees or of preparing for graduate study, upon application beforehand to the Committee on Academic Standards of the college or school in which they are registered, may be permitted to do the work of the fourth year, or a part thereof, at such other institution and to receive the bachelor's degree from WVU upon presentation of the proper credits.

The transfer student whose undergraduate work has been altogether in institutions within the West Virginia state system of higher education must complete either the last 30 hours of work, or a minimum of 36 hours including 16 of the last 32 hours, in residence. Other transfer students must complete either a total of at least 90 hours or the last 30 hours in residence at WVU. The transfer student may be required to earn up to 15 hours in the major field in residence regardless of the number of hours and the nature of the courses transferred.

Work Done Out of Residence

It is WVU policy to discourage the taking of regular residence courses in absentia. In the case of courses begun at WVU and not completed because of illness or for other acceptable reasons, however, permission to complete the work in absentia under the direction of regular WVU instructors may be granted by the Committee on Academic Standards of the college or school concerned; but in such case credit should be given only upon a report of a grade of no less than C on final examination. This regulation does not apply to WVU off-campus courses.

If the final grade of a student in any course is F, the student must take the course again in residence at WVU if the student desires to receive credit for it, unless the dean of the college or school authorizes the exception.

A student currently enrolled in WVU who wishes to obtain credit toward a WVU degree for courses offered at other institutions should obtain advance approval in writing from the adviser, the dean, and the Office of Admissions and Records. Some courses at some institutions are not directly transferable to WVU credit and, thus, the student runs the risk of losing such credit unless prior approval has been obtained. A student wishing to transfer credit from another institution should also be aware of the "Requirements As to Residence" and the specific degree requirements described elsewhere in this *Catalog*. Transfer credit from institutions outside the West Virginia state system will be accepted only for courses carrying a grade of C or higher when conditions indicated above have been met.

A student who has been suspended for academic deficiencies and who takes courses at other institutions during the period of suspension cannot automatically transfer such credit toward a degree at WVU upon readmission to the University. After one semester of satisfactory performance (C average or better on a minimum of 12 credit hours earned during the regular semester or during the summer sessions) the appropriate transfer credit will be entered into the student's record upon certification by the adviser and dean that the above conditions have been met.

Substitution for Required Course

A student who desires to substitute another course for any prescribed in the student's curriculum or required for the degree toward which the student is working must obtain permission for such substitution from the Committee on Academic Standards in the student's college or school.

Advanced Placement Credit

West Virginia University encourages students to work to their full capacity and to advance as rapidly as appropriate in their academic work. A number of opportunities are open to both qualified high school juniors and seniors, as well as to adults returning to school after an interval of work or military experience, to demonstrate competence beyond that normally associated with graduation from high school.

High school students who take college-level subjects offered in their schools in cooperation with the College Entrance Examination Board (CEEB) Advanced Placement Program should take the appropriate three-hour examinations administered by the Advanced Placement Service and have the scores sent to WVU. Credit for corresponding WVU courses will be given for high achievement on these tests.

Applicants for admission to the University, especially those who have gained a significant level of maturity through their life experiences, may gain college credit for their educationally related experiences through the College Level Examination Program (CLEP) of the CEEB. Policy of the West Virginia Board of Regents allows University credit to be awarded for successful completion of any of the CLEP Subject Examinations, except English composition, as well as allowing up to 34 hours of general education credit for successful performance on the CLEP General Examinations. Although the program is designed primarily for adults, exceptionally well qualified high school seniors may find it advantageous to seek advanced standing via the CLEP program. Interested applicants may write the Director of Admissions and Records for further information regarding the CLEP program and WVU credit.

Advanced placement also may be granted for specific military experience. Returning veterans should consult the Director of Admissions and Records for details.

After admission to WVU, students may elect to take examinations demonstrating their competence in particular course work. Credit or advanced placement is given for satisfactory completion of the tests. Students interested in challenging courses by examination should consult their advisers for procedures and details.

Credit by Examination

Students actively enrolled in WVU may receive credit for courses by demonstrating competency in the content covered by a particular course. The department responsible for administering the course will determine the evaluation tools. Where skill and cognitive abilities are components of the course, both will be evaluated. Credit will be given if a satisfactory degree of competency is demonstrated.

A college, school, or department may require students desiring such credit to prepare a self-evaluation statement determining the degree of competency they possess and the methods by which it was achieved.

Students interested in receiving credit for a course by examination should consult the college or school in which the course is offered for procedures and details.

Credit for Correspondence Work

Credit up to a maximum of 30 semester hours for work completed by correspondence in nonlaboratory courses will be accepted by WVU when such work is given by accredited colleges or universities that accept work for credit toward their own degrees and whose residence work is accepted by WVU.

Second Bachelor's Degree

A student who has received one baccalaureate degree and wishes to receive a second baccalaureate degree must satisfactorily complete enough additional credits so that the total, including all acceptable credits earned at WVU and elsewhere, is at least 30 semester hours more than the number required for the first baccalaureate degree; all requirements, departmental and otherwise, of the second baccalaureate degree program must be satisfied. In no case will a second baccalaureate degree be awarded to a student who has not met the University residence requirement (see "Requirements As to Residence").

A student who wishes to receive simultaneously two baccalaureate degrees must satisfactorily complete a minimum of 158 credits and meet all requirements, departmental and otherwise, of both degree programs. Students desiring to receive simultaneous baccalaureate degrees must be admitted to both programs and provide the Office of Admissions and Records of the college or school approvals in writing.

Visitors

Full-time University students may attend classes as visitors, provided they obtain the written permission of their advisers and of the instructors in classes they desire to visit. Members of the administrative or teaching staffs, or other regular employees of the University, may attend classes as visitors provided they obtain written permission of the chairpersons of their departments and of the instructors in the classes which they desire to visit.

No credit is given for work in such classes. Such persons may not obtain credit by advanced standing examinations in courses attended as visitors.

Auditors

Students may enroll in courses without working for grade or for credit by registering as auditors and by paying full fees. Change in status from audit to

credit or from credit to audit may be made during the registration period. Attendance requirements for auditors shall be determined by the instructor of the course being audited. It is the prerogative of the instructor to strike the name of any auditor from grade report forms and to instruct the Office of Admissions and Records to withdraw the auditor from the class, if attendance requirements are not met.

Summer Sessions

There are two summer sessions, each of six weeks duration. The first session begins approximately the middle of May and ends June 30. The second session begins July 1, and ends the second week of August. Requirements for admission and character of the work offered are the same for the summer sessions as for the regular academic year.

Credit may be obtained toward the bachelor's, master's, and doctorate. Offerings are varied from summer to summer so that students may complete work for the master's degree by attending summer sessions only.

For complete information, see the *WVU Summer Sessions Schedule of Courses.*

Evening Education

The University offers a program of evening classes for the benefit of those who wish to continue their education beyond the high-school level and who are unable to attend the usual day classes.

All courses are taught by resident faculty members and carry full college residence credit. Many of these courses may be counted toward advanced degrees.

Classification of Students

The following shows the number of semester hours required for classification as second-year, third-year, and fourth-year students:

Freshman classification ..... 1-28 semester hours, inclusive
Sophomore classification ..... 29-58 semester hours, inclusive
Junior classification ..... 59-88 semester hours, inclusive
Senior classification ..... 89-or more semester hours, inclusive

Grade-Point Average

All academic units of the University require minimum standards of scholastic quality. Grade points are computed only on grades earned at WVU and at other institutions in the West Virginia state system of higher education. To be eligible for graduation, a student must have a grade-point average of 2.0 (C) or higher on all work for which the student receives grades (except W, WU, and P). In addition, specific degree programs may require minimum grades of C, or in some cases higher than C, in specific courses or portions of the baccaulaureate program.

It is the student's responsibility to keep informed of the student's grade-point standing. This information may be obtained at any time from the dean of the college or school in which the student is registered.

Seventy-two hours of credits and grades earned for college-parallel courses completed at community colleges or branch colleges in the West Virginia system of higher education may be applied toward a baccalaureate

degree at WVU. Transfer credit for college-parallel courses completed at other community colleges and junior colleges is normally limited to lower-division courses.

Graduation with Honors

The University recognizes distinguished academic achievement by awarding initial and second baccalaureate degrees *summa cum laude, magna cum laude,* or *cum laude,* to qualified students. All candidates for a baccalaureate degree whose grade-point average is 3.8, or higher, shall be graduated *summa cum laude.* Those whose average is lower than 3.8, but equal to or higher than 3.6, shall be graduated *magna cum laude.* Those whose average is lower than 3.6, but equal to or higher than 3.4, shall be graduated *cum laude.*

1. Grade-point averages for graduation with honors shall be computed by starting with the student's penultimate semester or summer session and continuing in reverse chronological order until at least 80 semester hours of work taken at West Virginia University or other Board of Regents institutions, excluding credits earned with a grade of P, have been counted. If in order to total the required number of hours it is necessary to include any part of a semester or summer session, the work of the whole semester or session shall be included. If it is to the student's advantage to do so, the cumulative grade-point average on all work completed at WVU or BOR institutions may be considered, provided that the total hours completed are 80 or more.

2. The student who does not complete 80 semester hours at WVU or a BOR institution by the end of the penultimate semester, may petition his or her dean for a review of his/her individual case. The dean will forward all requests to the Provost for the final decision.

3. Fitting recognition of graduation *summa cum laude, magna cum laude,* or *cum laude* shall be made on the candidate's diploma and in the Commencement Program.

Students completing a second baccalaureate degree at the University are eligible to receive the honors distinction of *summa cum laude, magna cum laude,* and *cum laude.* The following regulations govern these awards:

1. Grade-point averages for graduation with honors shall be computed on the last 80 semester hours, excluding credits earned with a grade of P or S, completed at West Virginia University or a West Virginia Board of Regents institution.

2. At least 30 of the 80 semester hours must have been completed in the second degree program through the penultimate semester or summer session. The remainder of the 80 semester hours will be counted from the student's first baccalaureate degree program, counting in reverse chronological order from the semester or summer session of graduation. If, in order to total the required number of hours it is necessary to include any part of a semester or summer session, the work of the whole semester or session shall be included.

3. Subject to the above conditions, second baccalaureate degree students may be awarded the following honors recognition: *summa cum laude,* provided a grade-point average of 3.8 or higher has been achieved in both the post-baccalaureate hours and the last 80 hours; *magna cum laude,* provided a grade-point average of 3.6 or better has been achieved in both the post-baccalaureate hours and the last 80 hours; or *cum laude,* provided a grade-point average of at least 3.4 has been achieved in both the post-baccalaureate hours and the last 80 hours.

4. Fitting recognition of graduation *summa cum laude, magna cum laude,* or *cum laude* shall be made on the candidate's diploma and in the Commencement Program.

Examinations

Courses

As a rule courses extend through one semester only, although some are of a year's duration. No credit will be given for less than an entire course except by special order of the Committee on Academic Standards. Grades given at the end of the first semester in courses extending throughout the year are merely indicative of the quality of work done by the student to that point and do not give credit for the part of the course so far completed. Such first-semester grades may be considered in determining the final grade, however.

Summer sessions courses carry the same credit value as courses offered in the regular semesters.

Evaluation of Student Progress

Measurement and evaluation of learning, consistent with the objectives of the course, provide opportunity for the student and the teacher to evaluate progress through a variety of methods. Evaluation by final examination alone is discouraged.

Students are responsible for all materials presented or assigned in scheduled instructional sections. Failure to complete all assigned work may result in a report of I or a grade of F at the discretion of the instructor.

Final examinations are held during the last week of each semester of the academic year and during the last two days of each summer session. A listing in the *Schedule of Courses* each semester sets the time for final examinations.

The only tests permitted during the week of classes preceding finals will be in evening classes, practical laboratory tests, make-up examinations, and regularly scheduled short quizzes.

Absence From Examinations

The student is required to take all regular examinations. If a student attends a course throughout the semester and is absent from the final examination without permission, the instructor shall count the examination as zero and report the final grade as F. If, in the opinion of the instructor, the absence of the student was for satisfactory reason, a grade of I may be reported.

A student who has been absent because of illness, authorized University activities, or other reasons approved by the student's dean, has the opportunity to make up regularly scheduled examinations.

Grading, Absences, Withdrawals, Advising, Probation, Suspension, Readmission, Expulsion

Grading System

A — excellent (given only to students of superior ability and attainment)
B — good (given only to students who are well above average, but not in the highest group)
C — fair (average for undergraduate students)
D — poor but passing (cannot be counted for graduate credit)
F — failure
I — incomplete
W — withdrawal from a course before the date specified in the University Calendar. Students may not withdraw from a course after the specified date unless they withdraw from the University
WU — withdrawal from the University doing unsatisfactory work
P — pass (see Pass-Fail Grading below)
X — auditor, no grade and no credit
CR — credit but no grade
PR — progress. Final grade at end of the second semester (Medical Center)
S — satisfactory
U — unsatisfactory (equivalent to F)
*F — unforgivable F, not eligible for D/F repeat policy (see page 39)

Pass-Fail Grading

The basic purpose of pass-fail grading for undergraduates at WVU is to promote the undertaking of elective courses unrelated to the student's fields of degree concentration. A secondary purpose of pass-fail grading is to facilitate student grading in performance or competency based courses which may be an integral part of the student's program.

Student Option. Any full-time student who has completed 15 hours and maintains a 2.0 grade-point average may elect to take a maximum of 4 hours each semester or each summer session in which the grade earned will be either P (Pass) or F (Fail). The courses taken for pass-fail grading must be free electives and shall not exceed a total of 18 hours of credit. Unless otherwise indicated, excluded are courses in the student's major, courses in other subjects that are required by the major, and courses taken to satisfy either University, College, or School requirements. For example, courses elected to satisfy the English, Core, or Foreign Language requirements may not be taken for pass-fail grading.

The student electing the pass-fail grading option will be graded as a regular student and the appropriate letter grade will be submitted to the Office of Admissions and Records. The Office of Admissions and Records shall convert the earned letter grade to P-F on the basis of A, B, C, or D for a pass, and F for a fail.

The selection of a course for pass-fail grading must be made at registration and may not be changed after the close of the registration period.

College or School Option. A department or unit may designate any performance or competency based course which, with the approval of the college or school and the Faculty Senate, may be offered exclusively as P-F.

Such courses offered only as P-F shall not be included in the maximum of 18 hours that may be freely elected under the student option.

(This revised policy became effective as of the beginning of the First Semester, 1977-78, for grading under the Student Option.)

Grade Points

Grade points are based on the following grade-point values for each semester of credit:

A	B	C	D	F	I	U
4	3	2	1	0	0	0

The grade-point average is computed on all work for which the student has registered with the following exceptions:

(a) Courses with W, WU, P, S, and X.

(b) If an undergraduate student earns a grade of D or F in any course at WVU taken no later than the semester or summer session registration when a cumulative total of 60 hours has been attempted, and if this course is repeated in residence at WVU, one time only, the original grade shall be disregarded for the purpose of determining the student's grade-point average, hours passed and hours attempted, and the grade earned when the course is repeated shall be used in determining the student's grade-point average, hours passed and hours attempted. The first grade recorded shall not be deleted from the student's record and the second grade will be entered marked repeat, in the semester when taken. The repeat may be completed at any time prior to the receipt of a baccalaureate degree. *(Effective Date:* December 1985.)

The grade of F given in a course for disciplinary reasons or for cheating is not eligible to be deleted under the above D/F repeat rule. Such a grade will be indicated on the student's transcript by an *F and will be calculated in the grade-point average.

(c) The grade of I is given when an instructor believes that the course work is unavoidably incomplete or that a supplementary examination is justifiable. The grade of I must be removed within the following semester or the next semester in which the student is in residence, and becomes a failure unless special permission is granted by the appropriate Committee on Academic Standards to postpone removal.

For teacher certification the student is responsible for every registration in a course for which a grade of A, B, C, D, F, WU, P, or I is received.

Grade Reports

In the seventh week of classes of each semester, instructors in all undergraduate courses shall submit a report of students doing unsatisfactory work; that is, earning grades of D or F. These grades are used for counseling and are not recorded on the student's permanent record in the Office of Admissions and Records. These reports are sent to the Office of Admissions and Records and this information is transmitted to the student, parent or guardian, adviser, and the dean of the college or school.

Final grades are reported by instructors directly to the Office of Admissions and Records within 48 hours after the closing of the examination. The rule also applies to the final grades of all students registered in other colleges or schools of WVU who are enrolled in law courses.

The final standing of all seniors provisionally approved for graduation at the close of the second semester shall be reported by their instructors to the deans of their colleges and schools, and the final standing of all graduate

students provisionally approved for graduation shall be reported to the Assistant Vice President for Graduate Education. Special report cards are supplied by the Office of Admissions and Records.

A report of each student's work is made at the close of the semester or summer session to the student or to the student's parents or guardian.

Final Grade Appeals

Students have the right to appeal final course grades which they believe reflect a capricious, arbitrary, or prejudiced academic evaluation, or reflect discrimination based on race, color, creed, sex, or national origin. The grade appealed shall remain in effect until the appeal procedure is completed, or the problem resolved. The primary intent of this procedure is to provide a mechanism whereby a student might appeal a failing grade or a grade low enough to cause the student to be eliminated from some program or to require the repeat of a course. Grade appeals that do not meet this classification are not precluded. It is understood that an extension of time in the procedural steps may be granted students if in the professional judgment of the chairperson or the dean such an extension is warranted.

Appeal Procedure

Step 1. The student shall discuss the complaint with the instructor involved prior to the end of the succeeding regular semester, whether enrolled or not. If the two parties are unable to satisfactorily resolve the matter within two weeks, the student shall notify the chairperson of the instructor's department or division (or, if none, the dean). (The chairperson or dean will assume the role of an informal facilitator and assist the student and instructor in their resolution attempts.) If the problem is not resolved, the student may proceed directly to Step 2. If the instructor is not available, or if the nature of the complaint makes discussion with the instructor inappropriate, the student shall proceed directly to Step 2.

Step 2. The student must prepare and sign a document which states the facts constituting the basis for the appeal. Copies of this document shall be given to the instructor and to the instructor's chairperson (or, if none, to the dean). If, within ten working days of receipt of the student's signed document, the chairperson cannot resolve the problem to the satisfaction of the student and instructor involved, the complaint will automatically be forwarded to Step 3.

Step 3. Within one week of receipt of the complaint, the instructor's dean shall make a determination regarding the grade, making any recommendation for a grade change to the instructor involved. If the instructor involved does not act on the dean's recommendation, or if the student is in disagreement with the decision of the dean, the case will be referred to a representative body of the instructor's department or college or school for final resolution. The number and make-up of this body is to be determined by the appropriate dean. In cases of an appeal to this body, the faculty member involved shall receive written notification of the grade challenge which shall include a statement of the facts and evidence to be presented by the student in support of the charges made with sufficient clarity to reasonably disclose the claim for a grade change. The faculty member involved and the student making the appeal shall receive written notification that a hearing will be held before the department or college or school committee together with the notice of the date, time, and place of the hearing. The final decision of this body shall be forwarded to the

instructor involved. If the decision requires a change of grade, the instructor shall take action in accordance with the committee's decision. If the instructor does not act within five days, the dean will make the necessary grade adjustment. Implementation of this decision shall end the appeal procedure.

Absences

Students who are absent from class for any reason are responsible for work missed.

Students should understand that absences may jeopardize their grades or continuance in the course.

Instructors who use absence records in the determination of grades must announce this fact to students (in writing) within the first five class meetings.

It is the responsibility of the instructor to keep an accurate record of all students enrolled.

Instructors may report excessive absences to the student's dean or adviser.

Withdrawals

Withdrawal From Classes

Deadlines: Until the Friday of the tenth week of class (or Friday of the fourth week in a six-week summer session, or Friday of the second week of a three-week summer session), students may withdraw from individual courses. Deadlines will be published in the University *Schedule of Courses* each semester.

Procedures:

1. Before withdrawing from individual classes, students are reponsible for consulting their advisers to determine:

(a) Whether their course loads would be reduced below the minimum requirements set by their colleges or schools (if so, permission of the Committee on Academic Standards of the respective college or school is required *before* the course adjustment form may be submitted); *or*

(b) Whether their course loads would be reduced below the minimum number of hours required to qualify for special status, e.g., financial aid, varsity athletic competition, or international full-time student status; *or*

(c) Whether the courses to be dropped are required to fulfill academic probationary conditions; *and/or*

(d) Whether the courses from which they desire to withdraw might be

(1) Corequisite with other courses they are taking; or

(2) Prerequisite to other courses required for the next term.

2. Students must obtain adviser signatures on the University course adjustment forms and then submit the forms to the Office of Admissions and Records.

3. Students who withdraw from courses following all the established University procedures before the published deadline will receive a W on the transcript for the appropriate courses. Grade-point averages are not affected in any way by this mark.

Withdrawal From the University

Deadlines: Students may withdraw from the University *any time before the last day* on which regular classes are scheduled to meet. Students who

withdraw from the University before the Friday of the tenth week of classes (or the Friday of the fourth week in a six-week summer session, or the Friday of the second week of a three-week summer session) will receive grades of W in all their courses for that semester or session. Students who withdraw after these deadlines will receive grades of W in those courses in which satisfactory progress had been made; they will receive grades of WU for courses in which progress had been unsatisfactory.

Procedures:

1. Students who decide to leave WVU should withdraw from all classes and must do so in accordance with established University policy. Students are responsible for all *financial obligations* and for following established procedures, including the completion of forms and the delivery of the completed forms to appropriate officials. Students not fulfilling these financial obligations may have difficulty withdrawing from the University. The withdrawal becomes official only after the forms have been recorded by the Director of Admissions and Records.

2. Students who are unable to withdraw in person because of illness, accident, or other valid reasons, still must send to the Office of Student Life notification of their intention to withdraw. The notice should be verified in writing and the student ID and PRT cards enclosed.

3. Students who desire to withdraw from WVU must obtain a withdrawal form from the Office of Student Life (or dean's office of an off-campus instructional unit). Withdrawal procedure will be explained at that time. Identification (ID) and PRT cards must be presented.

4. With the help of their academic advisers, students are responsible for determining how withdrawal from the University may affect their future status with the University, including such aspects as suspension for failure to make progress toward a degree or violation of established academic probation and eligibility for scholarships, fellowships, or financial aid.

Re-Enrollment After Withdrawal

An undergraduate student who withdraws from WVU in two consecutive semesters (excluding summer sessions) may not register for further work without approval of the dean of the college or school in which the student wishes to register and subject to conditions set by that dean.

Advisers; Committee on Academic Standards

Advisers

Each student entering WVU is assigned an adviser whose duty is to assist students in preparing schedules, assign them to classes, and certify their study lists to the Director of Admissions and Records. The advisers are expected to give such advice and sympathetic guidance as the students may need in their work at the University. Students are expected to go freely to their advisers to discuss problems.

Advisers, upon receipt of reports of excessive numbers of absences, shall have conferences with the student concerned and shall make such recommendations and adjustments as are desirable and feasible. If the adviser does not find a satisfactory solution after a conference with the student, the case shall be reported to the dean of the college or school.

Committee on Academic Standards

The Committee on Academic Standards of each college or school shall have authority to proceed according to its best judgment in regard to students referred to it for consideration.

All orders of the committee shall become effective when approved by the dean of the college or school.

In exercising its authority the committee shall not suspend a student during a semester except for willful neglect and in cases where the student's class grades are so low that further class attendance would be a waste of time. No suspension shall become effective until approved by the dean of the college or school.

Probation, Suspension, Readmission, Expulsion Policy

Uniform Probation

Any undergraduate student whose cumulative average is 2.0 or higher is in good academic standing in the University. Every baccalaureate degree requires a minimum grade-point average of 2.0 for graduation.

Students whose cumulative grade-point average is below 2.0 will be notified on semester grade reports that their academic performance is unsatisfactory are then on probation.

Nothing in this statement prevents a unit from requiring a grade-point average above 2.0 or other academic requirements for purposes of determining probation or meeting degree requirements.

Uniform Academic Suspension Regulations

The student whose cumulative grade-point deficiency exceeds the "allowable grade-point deficiency" (see Table) is subject to suspension *at any time*. Normally, students are suspended at the end of a semester or summer school session. Deans have the authority to waive suspension in favor of probation if in their judgment the circumstances of individual cases so warrant. The suspension rule will be set aside only under extraordinary conditions.

Academic suspension identifies the status of a student who has failed to meet the University minimum standards and who has been notified formally by the dean of the college or school of academic suspension. Suspension from the University means that a student will not be permitted to register for any classes, including those in summer sessions, offered by the University for academic credit until the student has been officially reinstated. The normal period of suspension is a minimum of one academic semester but will not exceed one calendar year from the date of suspension.

A student who has been suspended for academic deficiencies and who takes courses at other institutions during the period of suspension cannot automatically transfer such credit toward a degree at West Virginia University upon readmission to the University. After one semester of satisfactory performance (C average or better on a minimum of 12 credit hours earned during a regular semester or during the summer sessions) the appropriate transfer credit will be entered into the student's record upon certification by the adviser and dean that the above conditions have been met. A student who has preregistered and is subsequently suspended shall have his/her registration automatically cancelled.

Maximum Allowable Grade-Point Deficiency*

*Total Hours Attempted***	*Maximum Grade-Point Deficiency***	*Total Hours Attempted***	*Maximum Grade-Point Deficiency***
0-19	20	55-59	12
20-24	19	60-64	11
25-29	18	65-69	10
30-34	17	70-74	9
35-39	16	75-79	8
40-44	15	80-84	7
45-49	14	85 or more	6
50-54	13		

*The grade-point deficiency is the difference between the number of grade points needed for a 2.0 average and the number of grade points that a student has actually earned in all courses attempted.

**Includes all hours attempted in institutions in the West Virginia System of Higher Education, excluding grades of P exclusive of the D-F Repeat Policy.

Readmission After Suspension

During the semester immediately following the effective date of suspension, students who have been suspended may petition the Committee on Academic Standards of the college or school to which they wish to be admitted in care of the dean. The normal periods for consideration of petitions are October 1–November 15 and March 1–April 15 of each academic year. The college or school petitioned shall establish the terms of readmission for successful student petitions.

After one calendar year from the effective date of suspension, any student who has been once suspended shall, upon written application, be readmitted to the University, with the terms of readmission to be established by the college or school entered by the readmitted student.

A suspended student who is readmitted under the provisions above will be placed on academic probation and will be subject to the maximum grade-point deficiency regulations as before, unless the terms of probation agreed to by the student require otherwise. Each college or school will have the right to establish minimum levels of performance expectations.

(*Effective:* August 15, 1980, for all students.)

Uniform Academic Expulsion Regulations

Academic expulsion from the University means that a student will *not* be permitted to register for any classes, including those in summer sessions, offered by the University. Academic expulsion can result from repeated failure to make academic progress and/or to meet probationary terms set forth in writing by the student's college or school.

After *five* calendar years from the effective date of academic expulsion, any student who has been expelled shall, upon written application, be *considered* for readmission to the University, with the terms of readmission to be established by the college or school entered by the readmitted student. Failure to meet these terms will result in permanent academic expulsion.

Academic Dishonesty

The academic development of students and the overall integrity of the institution are primary responsibilities of WVU. Academic dishonesty is condemned at all levels of life, indicating an inability to meet and face issues and creating an atmosphere of mistrust, disrespect, and insecurity. In addition, it is essential in an academic community that grades accurately reflect the attainment of the individual student. Faculty, students, and administrators have shared responsibilities in maintaining the academic integrity essential for the University to accomplish its mission.

Responsibilities

Students should act to prevent opportunities for academic dishonesty to occur, and in such a manner to discourage any type of academic dishonesty.

Faculty members are expected to remove opportunities for cheating, whether related to test construction, test confidentiality, test administration, or test grading. This same professional care should be exercised with regard to oral and written reports, laboratory assignments, and grade books.

Deans and department chairpersons are expected to acquaint all faculty with expected professional behavior regarding academic integrity, and to continue to remind them of their responsibility. Deans and department chairpersons shall assist faculty members and students in handling first-offense cheating allegations at the lowest possible level in the University, and with discretion to prevent damage to the reputation of any person who has not been found guilty in the prescribed manner.

Each member of the teaching faculty and all other WVU employees, including but not limited to assistants, proctors, office personnel, custodians, and public safety officers, shall promptly report each known case of academic dishonesty to the appropriate supervisor, department chairperson, or dean of the college or school concerned.

Academic Dishonesty Defined

Academic dishonesty is defined to include any of the following:

1. Plagiarism: Submitting for credit, without appropriate acknowledgment, a report, notebook, speech, outline, theme, thesis, dissertation, or other written, visual, or oral material that has been knowingly obtained or copied in whole or in part from another individual's academic composition, compilation, or other product, or commercially-prepared paper.
2. Cheating and dishonest practices in connection with examinations, papers, and projects, including but not limited to:
    a. Obtaining help from another student during examinations.
    b. Knowingly giving help to another student during examinations, taking an examination or doing academic work for another student, or providing one's own work for another student to copy and submit as his/her own.
    c. The use of notes, books, or any other source of information during examiniations, unless authorized by the examiner.
    d. Obtaining without authorization an examination or any part thereof.
3. Forgery, misrepresentation or fraud:
    a. Knowingly furnishing false statements in any University academic disciplinary proceeding.
    b. Forging or altering, or causing to be altered, the record of any grade in a gradebook, office or other education record.

c. Use of University documents or instruments of identification with intent to defraud.
d. Presenting false data or intentionally misrepresenting one's records for admission, registration or withdrawal from the University or from a University course.

Procedure for Handling Academic Dishonesty Cases

1. Procedures for infractions of institutional academic standards, rules, and regulations are published in the *University Catalog* and other written documents and are binding on all students.

2. Procedure for academic dishonesty including: plagiarism; cheating and dishonest practices in connection with examinations, papers and projects; and forgery, misrepresentation and fraud. Charges may be filed by any member of the academic community.

a. *Step 1.* At the discretion of the student, faculty member, and chairperson of the department, some cases where there is an admission, in writing, of guilt by the student may be satisfactorily resolved at the departmental level. The maximum penalty at Step 1 is an F in the course. Whenever a penalty is administered, the facts of the case shall be reported in writing to the dean of the college or school, and a copy forwarded to the Office of Judicial Programs in Moore Hall for the permanent records. In cases wherein cheating occurs in a college or school other than that in which the student is a degree candidate, the results of the case shall be reported to the dean of the college or school in which the student involved is enrolled.
b. *Step 2.* When the student denies guilt, or the faculty member or department chairperson feels the penalties available at Step 1 are insufficient for a specific act, the dean of the college or school in which the course is offered shall be notified in writing of the specifics of the case. The dean shall then implement the following steps:
   (1.) Formal notification to the student of the charges and the nature of the evidence, which if proved would justify action.
   (2.) Opportunity for the student and witnesses to respond in writing, rebutting the charges.
   (3.) Opportunity for the student to request that the case be forwarded by the dean to the University Conduct/Appeals Committee (Step 3).
   (4.) If the student admits guilt in a signed statement to the dean, or is found guilty, the dean shall prescribe the penalty deemed appropriate. The dean shall promptly report thereon in writing to the Office of Judicial Programs. A copy of such report will also be forwarded to the dean of the college or school in which the student is enrolled. The purpose of this copy of the report is to provide information in the event that further discipline or penalty may be deemed warranted by the dean of the college or school in which the student is a degree candidate. These records will be maintained by the dean(s) until the student graduates, at which time the records will be destroyed.
c. *Step 3.* The University Conduct/Appeals Committee shall handle cases referred by a dean or requested by a student. The case must be

heard using the University Conduct/Appeals Committee guidelines. The University Conduct/Appeals Committee shall present to the accused student and to the person making the accusation written notification of the charges, which shall include at least: (a) a statement that a hearing will be held before the University Conduct/Appeals Committee together with the notice of the date, time and place of the hearing; and (b) a clear statement of the facts and evidence to be presented in support of the charges made. If the University Conduct/Appeals Committee finds the student guilty, it will determine the penalty it deems appropriate under the circumstances and inform the student of its actions. The action taken by the University Conduct/Appeals Committee shall be final.

Dismissal From an Undergraduate Program

Dismissal from an undergraduate program based on program and/or professional performance standards other than cumulative grade-point average:

1. Reasons must be based on *Catalog* and other written documents describing academic performance standards and expectations.
2. Procedural

   Step 1. Counseling by departmental committee or representative as soon as possible after discovery of problem.

   Step 2. Second counseling by departmental committee or representative after opportunity to improve if performance has not changed sufficiently.

   Step 3. Formal review of student's status by departmental or program committee to determine:

   a. Student retained or recommended for dismissal.
   b. Counseling or remediation steps required as a condition of retention.
   c. Appeals if recommended for dismissal.

   Step 4. A dismissal decision by the dean of the student's school or college may be appealed to the University Conduct/Appeals Committee which will hold a hearing. The student may be advised by a person of his/her choice in the hearing.

   Step 5. A decision for dismissal must be reviewed by the appropriate academic Vice President who may confirm or remand the recommendation with specific conditions for the review process.

   Step 6. A recommendation for dismissal by the University Conduct/Appeals Committee confirmed by the appropriate academic Vice President may be appealed to the President whose decision is final.

Criminal Act in Connection With Cheating

If a student admits in writing that he/she has been guilty of academic dishonesty, or is found guilty of academic dishonesty by the University Conduct/Appeals Committee, in a case involving what is believed to be a criminal offense—such as theft of an examination or test materials, alteration of records, forgery, breaking or entering buildings, offices, desks, safes, or filing cabinets, damage to property, and other similar misconduct—the academic penalties and discipline as herein prescribed shall be applied. In addition, the facts of the case will be presented to the appropriate prosecuting attorney for further investigation and for such criminal or other action as may be warranted.

Degree Programs Offered by WVU

College of Agriculture and Forestry

Degree Program	Bachelor	Master	Doctorate/ Professional
Agricultural Biochemistry		M.S.	Ph.D.
Agricultural Economics		M.S.	
Agricultural Education	B.S.Agr.	M.S.	
Agricultural Microbiology		M.S.	Ph.D.
Agriculture		M.Agr.	
Agronomy		M.S.	Ph.D.
Animal Nutrition			Ph.D.
Animal and Veterinary Sciences	B.S., B.S.Agr.	M.S.	
Entomology		M.S.	
Forest Resources Management	B.S.F.		
Forest Resources Science			Ph.D.
Forestry		M.S.F.	
Horticulture		M.S.	
Landscape Architecture	B.S.L.A.		
Plant Pathology		M.S.	Ph.D.
Plant and Soil Sciences	B.S.Agr.		
Recreation and Parks Management	B.S.R.	M.S.	
Resource Management	B.S., B.S.Agr.		
Wildlife Management		M.S.	
Wildlife Resources	B.S.		
Wood Industries	B.S.F.		

College of Arts and Sciences

Biology	B.A.	M.S.	Ph.D.
Chemistry	B.A., B.S.	M.S.	Ph.D.
Computer Science	B.S.	M.S.	
Economics	B.A.		
English	B.A.	M.A.	Ph.D.
Foreign Languages	B.A.	M.A.	
Geography	B.A.	M.A.	
Geology	B.A., B.S.	M.S.	Ph.D.
History	B.A.	M.A.	Ph.D.
Interdepartmental Studies	B.A.		
Mathematics	B.A.	M.S.	
Philosophy	B.A.		
Physics	B.S.	M.S.	Ph.D.
Political Science	B.A.	M.A.	Ph.D.
Psychology	B.A.	M.A.	Ph.D.
Public Administration		M.P.A.	
Sociology and Anthropology	B.A.	M.A.	
Speech Communication	B.A.	M.A.	
Statistics	B.S.	M.S.	

Degree Program	Bachelor	Master	Doctorate/ Professional

Board of Regents Bachelor of Arts Degree

Board of Regents	B.A.		

(Intended for older students who wish to resume and complete their college studies. Detailed information available from the Coordinator, Board of Regents B.A. Degree Program, Student Services Center, West Virginia University, Morgantown, WV 26506.)

College of Business and Economics

Accounting	B.S.B.Ad.		
Business Administration	B.S.B.Ad.	M.B.A.	
Business Management	B.S.B.Ad.		
Economics	B.S.	M.A.	Ph.D.
Finance	B.S.B.Ad.		
Industrial Relations		M.S.	
Marketing	B.S.B.Ad.		
Professional Accountancy			M.P.A.

College of Creative Arts

Art	B.A.	M.A.	
Music	B.M.	M.M.	D.M.A., Ph.D.
Theatre	B.F.A.	M.A.,* M.F.A.	
Visual Art	B.F.A.	M.F.A.	

*The M.A. program will be phased out.

School of Dentistry

Dental Hygiene	B.S.		
Dentistry			D.D.S.
Endodontics		M.S.	
Orthodontics		M.S.	

College of Engineering

Engineering		M.S.E.	Ph.D.
Aerospace Engineering	B.S.A.E.	M.S.A.E.	
Chemical Engineering	B.S.Ch.E.	M.S.Ch.E.	
Civil Engineering	B.S.C.E.	M.S.C.E.	
Electrical Engineering	B.S.E.E.	M.S.E.E.	
Industrial Engineering	B.S.I.E.	M.S.I.E.	
Mechanical Engineering	B.S.M.E.	M.S.M.E.	
Occupational Health and Safety Engineering		M.S.	

Degree Program	Bachelor	Master	Doctorate/ Professional
College of Human Resources and Education			
Education			C.A.S., Ed.D.
Community Health Education		M.S.	
Counseling		M.A.	
Education Administration		M.A.	
Educational Psychology		M.A.	
Elementary Education	B.S.E.Ed.	M.A.	
Family Resources	B.S.Fam.Res.	M.S.	
Reading		M.A.	
Rehabilitation Counseling		M.S.	
Secondary Education	B.S.S.Ed.	M.A.	
Special Education		M.A.	
Speech Pathology and Audiology	B.S.	M.S.	
Technology Education		M.A.	
Interdisciplinary Programs			
Genetics and Developmental Biology		M.S.	Ph.D.
Liberal Studies		M.A.L.S.	
Reproductive Physiology		M.S.	Ph.D.
Perley Isaac Reed School of Journalism			
Journalism	B.S.J.	M.S.J.	
College of Law			
Law			J.D.
School of Medicine			
Anatomy		M.S.	Ph.D.
Biochemistry (Medical)		M.S.	Ph.D.
Medical Technology	B.S.	M.S.	
Medicine			M.D.
Microbiology (Medical)		M.S.	Ph.D.
Pharmacology and Toxicology		M.S.	Ph.D.
Physical Therapy	B.S.		
Physiology (Medical)		M.S.	Ph.D.
Biomedical Sciences			Ph.D.*
College of Mineral and Energy Resources			
Engineering in cooperation with College of Engineering			Ph.D.
Engineering of Mines	B.S.E.M.	M.S.E.M.	
Mineral and Energy Resources		M.S.	Ph.D.
Mineral Processing Engineering	B.S.		
Petroleum Engineering	B.S.Pet.E.	M.S.Pet.E.	

*Awarded under the auspices of the degree-granting authority of WVU, but in cooperation with the Basic Sciences Departments of Marshall University School of Medicine.

Degree Program	Bachelor	Master	Doctorate/ Professional
School of Nursing			
Nursing	B.S.N.	M.S.N.	
School of Pharmacy			
Pharmaceutical Sciences		M.S.	Ph.D.
Pharmacy	B.S.Pharm.		
School of Physical Education			
Education			C.A.S., Ed.D.
Physical Education	B.S.P.Ed.	M.S.	
Sport and Exercise Studies	B.S.P.Ed.		
Safety Studies		M.S.	
School of Social Work			
Social Work	B.S.W.	M.S.W.	

Academic Common Market

West Virginia provides its residents opportunity, through the Academic Common Market (ACM) and through contract programs, to pursue academic programs not available within the state. Both programs permit West Virginians to enter out-of-state institutions at reduced tuition rates.

Contract programs have been established for study in optometry, podiatry, and veterinary medicine. The ACM provides access to numerous undergraduate and graduate programs. The programs are restricted to West Virginia residents who have been accepted for admission to one of the specific programs at designated out-of-state institutions.

Through reciprocal agreement WVU allows residents of states within the ACM to enroll in specific undergraduate and graduate programs on an in-state tuition basis.

Further information may be obtained through Dr. Elaine K. Ginsberg, Assistant Vice President for Undergraduate Education, Stewart Hall, West Virginia University, P.O. Box 6001, Morgantown, WV 26506-6001. Application must be made through the higher education authority of the state of residence. For West Virginia residents this is the West Virginia Board of Regents, 950 Kanawha Boulevard, East, Charleston, WV 25301.

Part 4
CURRICULA AND COURSES

Plan for Numbering Courses

For convenience, each course of study is designated by the name of the department in which it is given and by the number of that course. The plan for numbering is as follows:

Courses 1-99—Courses intended primarily for freshmen and sophomores.

Courses 100-199—Courses intended primarily for juniors and seniors.

Courses 200-299—Courses for advanced undergraduate students and selected graduate students. No more than 40 percent of the credits counted for meeting requirements for a graduate degree can be at the 200 level.

Courses 300-399—Courses for graduate students; students in professional programs leading to the doctorate; and selected, advanced undergraduates. Undergraduates in any class carrying a 300-level course number must have a 3.0 cumulative grade-point average and have written approval on special forms from their instructors and advisers. Seniors within 12 semester hours of graduation may, with prior approval of their advisers, enroll in 300-level graduate courses for graduate credit. (In summary, 200-level courses are intended primarily to serve undergraduate students; 300-level courses are intended primarily to serve introductory graduate and master's degree course needs.)

Courses 391 (Advanced Topics) and 397 (Master's Degree Research or Thesis)—Courses are approved for University-wide use by any academic unit. These courses may be graded S or U.

Courses 400 to 499—Courses for graduate students only. All doctor's degree dissertation hours shall be awarded at the 400-level—specifically under course number 497. Courses numbered 497 may be graded S or U.

Courses 492 to 495—Courses are approved by the Assistant Vice President for Graduate Education. Approved requests are forwarded to the Office of Admissions and Records for entry into the *WVU Schedule of Courses*.

Graduate degree credit-hour requirements must include at least 60 percent at the 300 and 400 level.

Abbreviations Used in Course Listings

I — a course given in the first semester
II — a course given in the second semester
I, II — a course given in each semester
I and II — a course given throughout the year
Yr. — a course continued through two semesters
S. — a course given in the summer
hr. — credit hours per course
lec. — lecture period
rec. — recitation period
lab. — laboratory period
Conc. — concurrent registration required
PR — prerequisite
Coreq. — corequisite
consent — consent of instructor required
CR — credit, but no grade

Schedule of Courses

Before the opening of each semester and summer sessions, a *Schedule of Courses* is printed announcing the courses that will be offered by the colleges and schools of WVU. *Courses in this Catalog are subject to change without notice.*

College of Agriculture and Forestry

Robert H. Maxwell, Ph.D., *Dean of College of Agriculture and Forestry; Director of Agricultural and Forestry Experiment Station; Chairperson, Division of International Agriculture and Forestry; Professor of Agricultural Education.*
P. Vernon Armbrester, M.S., *Associate Dean for Academic Programs; Professor of Agricultural Education.*
Alfred L. Barr, Ph.D., *Associate Director, Agricultural and Forestry Experiment Station; Professor of Agricultural Economics.*
Mannon E. Gallegly, Ph.D., *Chairperson of Division of Plant and Soil Sciences; Professor of Plant Pathology.*
Robert L. Jack, Ph.D., *Interim Chairperson of Division of Resource Management; Professor of Agricultural Economics.*
Jack E. Coster, Ph.D., *Chairperson of Division of Forestry; Professor of Forest Entomology.*
Charles W. Foley, Ph.D., *Chairperson of Division of Animal and Veterinary Sciences; Professor of Animal Science and Animal Scientist.*

The College of Agriculture and Forestry is divided into five divisions of study—Animal and Veterinary Sciences, Forestry, Plant and Soil Sciences, Resource Management, and International Agriculture and Forestry. The college's faculty and staff are located in three major buildings on the Evansdale Campus and on four Morgantown area farms and a nearby forest.

Students in the college are offered a variety of fields of study which complement various careers. Emphasis can be placed on studying the biological sciences, animals, plants, trees or soils; or emphasis might be on the social sciences related to resource management or recreation, or on the artistic development of landscapes.

In short, the college and its curricula stress applied ecology, which deals with the relationship of living organisms to their environments. The student of agriculture and forestry studies many different subjects concerned with plants, animals, and microbes that interrelate with and affect our environment. The study of ecology, then, is interwoven throughout the courses offered in the college to give the student a comprehensive understanding of the basic elements at work in our environment.

Such emphasis on ecology is designed to offer students the education necessary for careers emphasizing the protection of environmental quality and the management, utilization, and conservation of our soil, water, forests, wildlife, domestic animals, our food and our fiber.

The college, too, is the site of the state's Agricultural and Forestry Experiment Station, so the University maintains extensive land for research purposes. This land is divided into areas devoted to dairy, livestock, poultry, forestry, wildlife, horticulture, agronomy, and soils. Students and professors use these areas regularly for instruction and research, and information gathered at these holdings is used to update subject matter in the classroom.

Degrees and Curricula

The College of Agriculture and Forestry offers five baccalaureate degrees and eleven curricula in which students may major. The degrees and curricula are:

Bachelor of Science (B.S.)
- Animal and Veterinary Sciences Curriculum
- Resource Management Curriculum
- Wildlife Resources Curriculum

Bachelor of Science in Agriculture (B.S.Agr.)
- Agricultural Education Curriculum
- Animal and Veterinary Sciences Curriculum
- Plant and Soil Sciences Curriculum
- Resource Management Curriculum

Bachelor of Science in Forestry (B.S.F.)
- Forest Resources Management Curriculum
- Wood Industries Curriculum

Bachelor of Science in Landscape Architecture (B.S.L.A.)
- Landscape Architecture Curriculum

Bachelor of Science in Recreation (B.S.R.)
- Recreation and Parks Management Curriculum

Admission

Students may be considered for admission to WVU on the basis of graduation and transcripts from accredited high schools. High school graduates are required to present credit for 4 units of English; 1 unit of biology; 3 units of social studies; 2 units of college preparatory mathematics, of which 1 unit must be algebra; 8 units chosen from the areas of fine arts, science, mathematics, computer science, foreign languages, and communication. In addition, agriculture and forestry require 1 unit of geometry.

Students who wish to major in areas of animal sciences, plant sciences, or resource management are admitted directly into the College of Agriculture and Forestry.

Students desiring admission to the Landscape Architecture program should check admission requirements with the Associate Dean's office of the College of Agriculture and Forestry or the WVU Office of Admissions and Records.

Students seeking admission to one of the curricula in Forestry must have earned 30 hours of specified college credit. (See Forestry section for entrance requirements.)

Additional information concerning admissions, fees and expenses is in Part 2 of the *Undergraduate Catalog*. Academic information is in Part 3.

Transfer Credits

Students transferring into the College of Agriculture and Forestry from one or two-year technical programs, or from unaccredited programs, must take examinations to demonstrate proficiency for any required course offered by the College of Agriculture and Forestry for which transfer credit is sought. In addition, the Division of Forestry applies this rule to dendrology and surveying. All other credits are accepted subject to the regulations of the Office of Admissions and Records.

Credit Load Per Semester

To be considered a full-time student in the College of Agriculture and Forestry, students must enroll for a minimum of 12 credit hours per semester. The maximum work per semester is 20 credit hours.

Students may enroll for less than the minimum or more than the maximum number of credit hours if the student's adviser, in consultation with the student, determines justifiable reasons exist.

Students may petition the College's Academic Standards Committee to reverse a decision rendered by the student's adviser.

Assigned Topics/Independent Study

A maximum of 12 credit hours of Assigned Topics and/or Independent Study may be counted toward fulfilling the requirements for a bachelor's degree in the College of Agriculture and Forestry.

Honors

The College recognizes outstanding academic achievement by awarding President's and Dean's Lists status to those students obtaining a 4.0 grade-point average or 3.4 grade-point average, respectively. Students must be enrolled full time to be eligible for the President's or Dean's List in any one semester.

Students may obtain *Summa Cum Laude*, *Magna Cum Laude*, or *Cum Laude* recognition upon graduation by earning the overall grade-point average as set forth by University regulations.

Applications for Graduation

All candidates for the bachelor's degree in the College of Agriculture and Forestry must fill out an application for graduation in Room 1006 of the Agricultural Sciences Building at the beginning of the semester in which they expect to receive their degrees.

Grade-Point Deficiencies

Academic Warning

A student with a grade-point average less than 2.0 at the end of a period of enrollment shall be placed on academic warning. Students on academic warning shall be limited to a maximum of 15 credit hours per semester. Students shall be notified in writing of their academic status by the Associate Dean.

Academic Probation

Students who have been reinstated after suspension and students who have transferred from another college with less than a 2.0 grade-point average shall be placed on academic probation until the grade-point deficiency is reduced to a level less than the maximum allowable without suspension. At such time the student will be reassigned to an adviser by the appropriate division chairperson.

While on academic probation a student shall be required to maintain a minimum grade-point average of 2.25 in order not to be suspended.

The Associate Dean's office shall serve as adviser to all students on academic probation.

Academic Suspension and Probation

Students whose grade-point average is below that allowed by WVU at the end of a period of enrollment shall be suspended by the College of Agriculture and Forestry and notified in writing by the Associate Dean.

Students may be reinstated by petitioning the Academic Standards Committee to:

1. Enroll for the summer session to eliminate the grade-point deficiency.

2. Re-enroll according to regulations as set forth by the Academic Standards Committee.

3. After one calendar year a student may enroll in the college, school, or program of his/her choice but under conditions of probation as set forth by the college, school, or program where the student is enrolled.

Students reinstated will be placed on academic probation and may enroll for a maximum of 15 credit-hours and maintain a minimum 2.25 grade-point average for each semester enrolled. The Academic Standards Committee has the option to reduce the hours taken and increase the grade-point average of students on academic probation.

Courses and Programs

General Agriculture

A general agriculture degree is not available in the College; however, students may enroll in a general agriculture program (approximately one year) until such time as a major has been selected.

Agriculture (Agrl.)

11. *Professions in Agriculture.* I. 1 hr. Survey of the subject-matter disciplines available to agriculture graduates. Study of all the dimensions of the industry of agriculture.

12. *Professions in Agriculture.* II. 1 hr. Continuation of Agrl. 11.

200. *Agricultural Travel Course.* S. 1-6 hr. Tour and study of production methods in major livestock and crop regions of the United States and other countries. Influence of population, climate, soil, topography, markets, labor, and other factors on agricultural production.

Agriculture and Forestry (Ag. & F.)

180. *Assigned Topics.* I, II, S. 1-4 hr. Assigned studies of an interdisciplinary nature with a particular specialty area in agriculture and forestry. Students must be in good standing and have prior approval of a proposed outline from the Division Director's Office.

190. *Professional Development.* I, II, S. 1 hr. per sem. PR: Cooperative education commitment. Evaluation of cooperative education experience in an independent work-study program.

295. *Professional Field Experience.* I, II, S. 1-12 hr. PR: Division approval of planned program. Junior or senior standing recommended. Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competency development. *(Pass/Fail Grading.)*

Agricultural Biochemistry

Interdivisional Program of Agricultural Biochemistry

Charles W. Foley, Ph.D. (U. Mo.), *Chairperson, Division of Animal and Veterinary Sciences; Professor of Animal Science and Animal Scientist.*

James L. Brooks, Ph.D. (U. Cal.), *Professor of Agricultural Biochemistry and Associate Agricultural Biochemist.*

William H. Hoover, Ph.D. (Penn St. U.), *Professor of Dairy Nutrition.*

L. Morris Ingle, Ph.D. (Purdue U.), *Professor of Horticulture and Plant Biochemistry and Horticulturist.*

Walter J. Kaczmarczyk, Ph.D. (Hahnemann Med. C.), *Professor of Genetics and Agricultural Biochemistry and Associate Geneticist.*
William G. Martin, Ph.D. (WVU), *Program Chairperson; Professor of Agricultural Biochemistry and Agricultural Biochemist.*
Robert L. Reid, Ph.D. (Aberdeen U.), *Professor of Animal Nutrition and Agricultural Biochemistry and Nutritionist.*
David A. Stelzig, Ph.D. (N.D. St. U.), *Professor of Agricultural Biochemistry and Agricultural Biochemist.*
Valentin Ulrich, Ph.D. (Rutgers U.), *Professor of Genetics and Agricultural Biochemistry and Geneticist.*

Agricultural Biochemistry (Ag. Bi.)

180. *Assigned Topics.* I, II. 1-4 hr. PR: In order to be eligible to register in Assigned Topics, the student must: (1) be in good standing and (2) obtain approval of the Division of Animal and Veterinary Sciences Chairperson before registration.

210. *Introductory Biochemistry.* I, II. 3 hr. PR: Two semesters of general chemistry and one semester of organic chemistry. The biochemistry of the proteins, carbohydrates, lipids, nucleic acids, enzymes, coenzymes, and cellular metabolism in plants and animals.

211. *Introductory Biochemistry Laboratory.* I. 1 hr. Conc.: Ag. Bi. 210. Experiments to demonstrate certain principles and properties of animal and plant biochemicals.

212. *Nutritional Biochemistry.* II. 3 hr. PR: Ag. Bi. 210 or consent. Nutritional biochemistry of domestic animals.

213. *Nutritional Biochemistry Laboratory.* II. 1 hr. PR: Ag. Bi. 210, 211; Conc.: Ag. Bi. 212. Experiments to determine the nutritional constituents in animal and plant tissues.

310. *General Biochemistry.* I. 4 hr. PR: 8 hr. organic chemistry. The first half of a general course of biochemistry designed for graduate students of biological sciences. The course emphasizes the chemical properties of cellular constituents.

311. *Laboratory Experiments in Biochemistry.* I. 2 hr. PR or Conc.: Ag. Bi. 310. Experiments to demonstrate some of the basic tools and procedures of biochemical research.

312. *General Biochemistry.* II. 4 hr. PR: Ag. Bi. 310 or consent. The second half of a general course of biochemistry designed for graduate students of biological sciences. The course emphasizes reactions and control of intermediary metabolism.

314. *Radionuclide Biochemistry.* II. 3 hr. PR: Chem. 1, 2, 131, or consent. Radionuclide methods and isotope handling as needed by students interested in biological research.

Division of Animal and Veterinary Sciences

Faculty

Professors

William E. Collins, Ph.D. (U. Wisc.). Reproductive physiology.
C. Jett Cunningham, B.S. (VPI&SU)—*Emeritus.*
Robert A. Dailey, Ph.D. (U. Wisc.). Reproductive physiology.
Robert S. Dunbar, Ph.D. (Cornell U.)—*Emeritus.*
Leslie Dozsa, D.V.M. (C. Vet. Med., Budapest). Veterinary medicine.
C. William Foley, Ph.D. (U. Mo.)—*Chairperson.* Reproductive physiology.
Thomas J. Galvin, Ph.D. (Tex. A&M U.). Veterinary parasitology.
William H. Hoover, Ph.D. (Penn St. U.). Animal nutrition.
Donald J. Horvath, Ph.D. (Cornell U.). Nutrition. Physiology.
E. Keith Inskeep, Ph.D. (U. Wisc.). Reproductive physiology.

Harold E. Kidder, Ph.D. (U. Wisc.). Reproductive physiology.
Paul E. Lewis, Ph.D. (WVU). Reproductive physiology.
William G. Martin, Ph.D. (WVU). Nutritional biochemistry.
Marvin R. McClung, Ph.D. (Iowa St. U.)—*Emeritus.*
George A. McLaren, Ph.D. (Okla. St. U.)—*Emeritus.*
Norman O. Olson, D.V.M. (Wash. St. U.)—*Emeritus.*
Robert L. Reid, Ph.D. (Aberdeen U.). Ruminant nutrition.
James A. Welch, Ph.D. (U. Ill.). Reproductive physiology.
Dale W. Zinn, Ph.D. (U. Mo.)—*Director-at-Large, Northeast Agricultural Experiment Station.* Food sciences.

Associate Professors

Richard R. Koes, Ph.D. (U. Mo.)—*Extension Specialist.* Nutrition.
Ronald A. Peterson, Ph.D. (Mich. St. U.). Nutrition. Physiology-poultry.
Edward C. Prigge, Ph.D. (U. Maine). Animal nutrition.
LeRoy P. Stevens, M.S. (WVU). Agricultural sciences.
Roy O. Thomas, Ph.D. (Mich. St. U.). Animal nutrition.

Assistant Professors

Edsel Gainer, Ed.D. (N.C. St. U.). Animal science.
Ellen R. Jordan, Ph.D. (Ore. St. U.)—*Extension Specialist.* Reproductive physiology.
Robert McCurley, Ph.D. (U. Tenn.). Animal genetics.
Phillip I. Osborne, Ph.D. (Clemson U.)—*Extension Specialist.* Livestock marketing and production.
Paul M. Smith, M.S. (WVU). Food sciences.
Wayne R. Wagner, Ph.D. (Colo. St. U.)—*Extension Specialist.* Animal breeding and genetics.

Instructor

Patrick Kenney, M.S. (Okla. St. U.). Food sciences.

Programs of Study in Animal Science, Dairy Science, Poultry Science, and Food Science

Students taking programs in this division may work towards degrees which enable them to do graduate work, go into commercial agriculture, work for federal or state agencies, the food processing industry, and other areas of food and agriculture. The program in Pre-Veterinary Medicine provides requirements for entry into veterinary colleges. Many pre-veterinary students obtain their bachelor degrees when meeting veterinary school requirements.

Students enrolled in programs in the division take courses in breeding, nutrition, pathology, food science, and animal production. To assist in equipping themselves for the many varied careers in animal agriculture, students take supporting courses in other divisions of the College of Agriculture and Forestry and in other colleges. These include courses such as agricultural biochemistry, mathematics, chemistry, biology, finance, business law, and accounting. The programs are flexible enough to permit the student to obtain a broad background and take enough courses in an area the last two years to prepare for the first job.

Bachelor of Science

ANIMAL AND VETERINARY SCIENCES CURRICULUM

The curriculum in science, with its flexible design, will provide the student with the opportunity to acquire the necessary background in agricultural biochemistry, mathematics, chemistry, physics, and modern concepts of biology in preparation for professional schools of veterinary

medicine, human medicine, dentistry, and law, or graduate study in such fields as agricultural biochemistry, animal breeding, animal physiology, and nutrition. Selection of individual courses is the responsibility of the student in consultation with an adviser.

Curriculum Requirements	*Hours*
English Composition and Rhetoric (or conformity with University English requirements)	6
Arts and Humanities (Group A)	12
Social and Behavioral Sciences (Group B)	12
Natural Sciences (Group C included)	40
(A minimum of two courses in each of biology, chemistry, physics, and calculus required. The pre-professional student may substitute advanced chemistry courses for calculus to meet degree requirements. This ordinarily means organic chemistry and/or biochemistry.)	
Courses in the College of Agriculture and Forestry	24
Free electives	34
Total	128

Bachelor of Science in Agriculture

ANIMAL AND VETERINARY SCIENCES CURRICULUM

The curriculum of Bachelor of Science in Agriculture will provide the student with the opportunity to acquire the necessary background in biochemistry, nutrition, breeding, physiology, pathology, agricultural economics, and agronomy to become prepared for a career in animal, dairy, or poultry production and management. There also are food science courses available under the curriculum for those students who are interested in preparing for opportunities in food processing related to dairy, poultry, and meat products.

Curriculum Requirements	*Hours*
English Composition and Rhetoric (or conformity with University English requirements)	6
Arts and Humanities (Group A)	12
Social and Behavioral Sciences (Group B)	12
Natural Sciences (Group C included)	24
(Must elect a minimum of 8 credits in biology; 8 credits in chemistry; 3 credits in college algebra or equivalent.)	
Courses in Agriculture	45
Elect a minimum of a 3-credit course, excluding Assigned Topics, in each of the following: 1. Animal Science; 2. Plant Science; 3. Soil Science; 4. Agricultural Economics. Elect additional courses to obtain a total of 45 hours in Agriculture.	
Free electives	37
Total	136

Pre-Veterinary Medicine Program

This program is designed to provide students with the academic requirements for entry into professional schools or colleges of veterinary medicine. West Virginia has agreements with Ohio State University and with the Southern Regional Education Board whereby each year up to five students may be accepted by Ohio State University and up to eleven may be placed

through the Southern Regional Education Board. In order to qualify for these positions the students must have been West Virginia residents for at least the past five years at the time of application.

Applicants for admission to these colleges of veterinary medicine must present at least 78 semester hours of acceptable credit. Since a maximum of six teen eligible students are accepted each year, alternate goals in either of the other degree programs are urged for all pre-professional students.

Applicants with a grade-point average of 3.0 or above will be given first consideration for admission to these institutions.

A student who has completed 90 hours of course work at WVU, or 90 hours at institutions within the West Virginia state system of higher education, including at least 36 at WVU, and has completed all required courses for the degree, may transfer credit from a veterinary college to WVU and receive the bachelor's degree.

The *equivalent* of the following pre-professional courses currently meet requirements for contract colleges of veterinary medicine.

Curriculum Requirements	*Hours*
Agricultural Orientation	2
Animal and Poultry Science	6
Animal Nutrition	3
Biochemistry	4
Biology	8
Chemistry (Inorganic)	8
Chemistry (Organic)	8
English	6
Mathematics	6
Microbiology	4
Physics	8
Principles of Heredity	4
Total*	69

*Students are urged to consult their advisers for current requirements of individual veterinary colleges.

Courses of Instruction

Animal and Veterinary Science (A&VS)

51. *Principles of Animal Science.* I. 4 hr. A comparative study of the production of meat, milk, eggs, and wool. Nutrition, physiology, genetics, hygiene and physical environment, and economics are discussed as bases for sound managerial decisions. 1 lab.

180. *Assigned Topics.* I, II, S. 1-4 hr. per sem. In order to be eligible to register in A&VS 180, the student must: (1) be in good standing, and (2) obtain approval of the instructor supervising the topic and the instructor assigned responsibility for the course.

190. *Teaching Practicum.* I, II, S. 1-3 hr. Teaching practice as a tutor or assistant in Animal Science.

195. *Seminar.* II. 1 hr. Senior seminar.

197. *Honors.* I, II, S. Independent reading and study.

Animal Nutrition (An. Nu.)

101. *Animal Nutrition.* I, II. 3 hr. PR: Two courses in chemistry. Digestion and metabolism of food nutrients, nutrient requirements of farm animals, and nutritive values of feeds and rations.

294. *Poultry Nutrition.* II. 3 hr. PR: An. Nu. 101. Nutritional requirements, interrelationships, and deficiencies of all types of domesticated fowl.

301. *Principles of Nutrition and Metabolism.* I. 3 hr. PR: Ag. Bi. 210 or consent. A basic course in principles of nutrition with emphasis on the major classes of dietary nutrients and their digestion and utilization.

302. *Nutrition and Physiological Function.* II. 3 hr. PR: An. Nu. 301 or consent. Sequence to An. Nu. 301. Techniques used in nutritional studies and the relationship of nutrient requirements to physiological function in species of laboratory and domestic animals and man.

304. *Nutrition Laboratory Methods.* II. 2 hr. PR: An. Nu. 301 and consent. Diet preparation, food analysis, management of laboratory animals, demonstration of specific nutrient deficiencies, and the conduct and analysis of animal feeding trials designed to examine the nutritional properties of experimental diets.

Animal Physiology and Breeding (An. Ph.)

100. *Introduction to the Physiology of Domestic Animals.* I, II. 3 hr. PR: Biol. 1 and 3 or consent. The function and regulation of the principal systems of the animal body.

204. *Animal Physiology Laboratory.* I. 2 hr. PR: An. Ph. 100 or consent. Laboratory study of the physiological systems of animals and the influences of environment on these systems.

225. *Physiology of Reproduction.* II. 3 hr. PR: Course in biology. Comparative physiology of reproduction in higher animals; endocrine functions involved in reproduction; genetic and environmental variations in fertility mechanisms.

226. *Breeding of Farm Animals.* I. 3 hr. PR: Course in genetics or consent. Application of principles of quantitative genetics to the improvement of farm animals.

280. *Behavioral Patterns of Domestic Animals.* II. 3 hr. Examination of the bases for exhibition and control of behavioral patterns of domestic animals. 1 lab.

Animal Production (An. Pr.)

108. *Animal Production Experience.* I, II. 1 hr. A maximum of 4 credit hours may be earned by enrolling in this course. Experience in operating a poultry, dairy, or livestock farm, including trapnesting, incubation, and pedigreeing poultry; feeding, handling, calving, lambing, or farrowing of dairy and beef cows, sheep, and hogs. 3 hr. lab.

137.* *Dairy Cattle History and Selection.* II. 3 hr. To familiarize the student with the breeds of dairy cattle as well as modern concepts in phenotype and performance record evaluation. 2 labs.

138.* *Grading and Selection of Meat and Meat Animals.* II. 3 hr. Appraisal of live animals and evaluation of scientific techniques used in selecting animals. Tours of representative flocks and herds will be required. 2 labs.

139.* *Selection, Evaluation, and Grading of Meat Animals.* I. 2 or 4 hr. PR: An. Pr. 138 and consent. Evaluation of breeding merit and potential carcass characteristics of red meat animals. Tours of representative flocks and herds will be required.

*Transportation for required trips in connection with these courses will generally be supplied by the College of Agriculture and Forestry. Students are responsible for their meals and lodging.

141.* *Beef Production.* I. 3 hr. PR: An. Nu. 101. Applying the principles of breeding, nutrition, physiology, and economics for the production of beef cattle.

142.* *Pork Production.* I. 3 hr. PR: An. Nu. 101. Physiological and economical bases of pork production. 1 lab.

144.* *Light Horse Science.* II. 3 hr. PR: An. Nu. 101. The application of breeding, nutrition, physiology, and pathology to production and management of light horses. 1 lab.

145.* *Milk Production.* II. 3 hr. PR: An. Nu. 101. Feeding and management of dairy cattle. 1 lab.

146.* *Sheep Production.* II. 3 hr. PR: An. Nu. 101. Physiological and economical bases of sheep production. 1 lab.

240.* *Poultry Production.* I. 3 hr. PR: An. Nu. 101. Special phases of broiler and egg production, disease control, labor-saving studies, and recent designs in housing and equipment for all types of poultry. 1 lab.

250. *Current Literature in Animal Science.* I. 3 hr. PR: An. Nu. 101. Evaluation of current research in animal science and its application to production and management.

Food Science (Fd. Sc.)

107. *Milk and Public Health.* I. 3 hr. Food value of milk and its production and processing in relation to public health. 1 lab. *(Offered in Fall of odd years.)*

112. *Dairy Technology.* II. 3 hr. Introductory. Composition and properties of milk and milk products, butterfat testing, manufacture of dairy products. 1 lab. *(Offered in Spring of odd years.)*

130. *Market Milk Products and Frozen Desserts.* I. 4 hr. Assembling, processing, packaging, storing and merchandising dairy products. 1 lab. *(Offered in Fall of even years.)*

134. *Judging Dairy Products.* II. 2 hr. A laboratory course in evaluating and judging dairy products. 2 labs.

166. *Meat Technology.* I. 3 hr. Emphasis on techniques of slaughtering, cutting, breaking, manufacturing, inspecting, and grading beef, veal, pork, lamb, and poultry meat and muscle food products; meat plant design, technology, sanitation, operation, and management.

167. *Meat Science.* II. 3 hr. PR: Biol. 2 and 4 and Chem. 12 or equiv. Emphasis on basic physical, chemical, anatomical, and nutritional characteristics of muscle foods; methods of analysis and quality assurance in processing muscle foods.

267. *Advanced Meat Science.* I, S. 3 hr. PR: Fd. Sc. 167. Theoretical and experimental aspects of meat science, meat product/process systems, and the quantitative biology of muscle systems used for food.

Veterinary Science (Vet. S.)

102. *Animal Pathology.* II. 3 hr. Diseases of animals, with special emphasis on the common diseases.

205. *Parasitology.* II. 3 hr. PR: Course in biology or consent. Common parasites of farm animals, their life cycles, effects on the host, diagnosis, control and public health importance. 3 hr. lec., 1 hr. lab.

*Transportation for required trips in connection with these courses will generally be supplied by the College of Agriculture and Forestry. Students are responsible for their meals and lodging.

210. *Principles of Laboratory Animal Science.* I. 3 hr. PR: Consent for undergraduates. The management, genetics, physiology, nutrition, disease, and germ-free quartering of common laboratory animals. 1 lab.

Division of Forestry

Faculty

Professors

Jack E. Coster, Ph.D. (Tex. A&M U.)—*Chair.* Forestry, Entomology.

Eugene C. Bammel, Ph.D. (Syracuse U.). Recreation and Parks. Leisure theory, Historical interpretation, Tourism.

Lei Lane Bammel, Ph.D. (U. Utah). Recreation and Parks. Leisure studies, Research designs.

Samuel M. Brock, Ph.D. (U. Minn.). Forest Management. Forest resource economics, Forest management, Economics of conservation.

Maurice G. Brooks, M.S. (WVU)—*Emeritus.*

Kenneth L. Carvell, D. For. (Duke U.). Forest Management. Silviculture, Forest ecology.

Franklin C. Cech, Ph.D. (Tex. A&M U.). Forest Management. Forest genetics, Artificial regeneration, Micro propagation.

Kenney P. Funderburke, Jr., B.S.F. (U. Ga.)—*Adjunct.* Forest management.

Allen W. Goodspeed, M.F. (Yale U.)—*Emeritus.*

John R. Hamilton, Ph.D. (N.C. St. U.). Wood Science. Wood structure, Environmental influences on wood properties.

Ray R. Hicks, Jr., Ph.D. (SUNY). Forest Management. Forest ecology, Forest pest management.

Joseph M. Hutchison, Jr., M.S. (WVU). Recreation and Parks. Recreation and parks management, Administration, planning, policy.

Norman D. Jackson, M.W.T. (N.C. St. U.). Wood Science. Harvesting and primary manufacturing.

William E. Kidd, Jr., M.S.F. (VPI&SU)—*Extension Specialist.* Wood management.

Christian B. Koch, Ph.D. (U. Mich.). Wood Science. Mechanical properties, Wood products.

Edwin D. Michael, Ph.D. (Tex. A&M U.). Wildlife Management. Wildlife management, Wetland wildlife.

David E. Samuel, Ph.D. (WVU). Wildlife Management. Policy and administration, Wildlife attitudes, Hunter education.

Robert L. Smith, Ph.D. (Cornell U.). Wildlife Management. Habitat assessment, Ecology of disturbed ecosystems, Population ecology.

Stanislaw Jan Tajchman, Ph.D. (U. Munich). Forest Management. Forest meterology.

Earl H. Tryon, Ph.D. (Yale U.)—*Emeritus.*

David E. White, Ph.D. (SUNY). Forest Management. Forestry economics, Policy analysis.

Robert C. Whitmore, Ph.D. (B. Young U.). Wildlife Management. Avian ecology, Quantitative ecology.

Harry V. Wiant, Jr., Ph.D. (Yale U.). Forest Management. Mensuration, Silviculture.

David O. Yandle, Ph.D. (N.C. St. U.). Forest Management. Forest biometrics, Statistics.

Associate Professors

Franklin E. Boteler, Ph.D. (Penn St. U.). Recreation and Parks. River recreation, Visual resources, Forest recreation.

Carter S. Hall, M.B.A., (WVU). Wood Science. Waste utilization, Industrial safety.

Beverly Z. Hummel, M.S. (U. Ill.). Recreation and Parks. Therapeutic recreation, Gerontology.

Henry C. Smith, M.S.F. (Purdue U.)—*Adjunct.* Silviculture.

Joseph N. Yeager, M.S. (WVU)—*Extension Specialist.* Youth, Education, Industrial development.

William L. Wylie, M.S. (WVU). Recreation and Parks. Forestry, Interpretation wildlife.

Gary W. Zinn, Ph.D. (SUNY). Forest Management. Forest economics, Forest policy, Economic development.

Assistant Professors

James P. Armstrong, Ph.D. (SUNY). Wood Science. Physical behavior of wood, Hardwood drying.

David W. Patterson, Ph.D. (Tex. A&M U.). Wood Science. Plant layout, Operations research.

Anthony C. Tomkowski, M.S.F. (WVU). Forest Management. Fisheries, Forestry, Forest water quality.

Peter E. Zurbuch, M.S. (U. Mich.)—*Adjunct.* Fisheries biology, Wildlife management.

Instructors

Jack I. Cromer, M.W.M. (U. Mich.)—*Adjunct.* Game management, Game research.

J. David Helvey, M.S. (U. Ga.)—*Adjunct.* Forest hydrology.

William Santonas, B.S. (Ohio U.)—*Adjunct.* Wildlife management planning, Coordination, Biometrics.

Programs of Study

The Division of Forestry offers curriculums in Forest Resources Management, Wood Industries, Recreation and Parks Management, and Wildlife Resources. The first two curriculums lead to the degree of Bachelor of Science in Forestry (B.S.F.); the curriculum in Recreation and Parks Management leads to the degree of Bachelor of Science in Recreation (B.S.R.); the Wildlife Resources curriculum leads to the degree of Bachelor of Science (B.S.)

West Virginia University is one of 44 institutions of higher learning in the United States whose forestry programs are accredited by the Society of American Foresters. The society is the accrediting agency recognized by the U.S. Office of Education.

Entrance Requirements

Students who wish to major in one of the curriculums offered by the Division of Forestry must have completed at least 30 hours of college credit with a stipulated grade-point average. The 30 hours may be earned at any institution of higher learning. Specific requirements are listed in each curriculum.

Students enrolling at WVU as freshmen who wish to gain admission to one of the Division of Forestry curriculums will be enrolled as General Forestry students in the College of Agriculture and Forestry to fufill the entrance requirements of the curriculum in which he or she wishes to major. Entrance requirements must be satisfied by the time the student has completed no more than 70 hours of credit at WVU. Otherwise, the student *will not* be admitted to a Division of Forestry major.

Transfer students who wish to major in one of the curriculums offered by the Division of Forestry must also satisfy the specified entrance requirements. Transfer students who have completed the basic 30 hours and have attained the stipulated grade-point average *or* students with 70 or more hours of credit, not including the specified courses, but who have attained the stipulated grade-point average, will be admitted directly to their chosen curriculum.

Transfer students with 70 or more hours of credit but who have not attained the stipulated grade-point average will be permitted to enroll for one probationary semester in the General Forestry curriculum. At the conclusion of the probationary semester, if the stipulated grade-point average has not been attained, another major must be elected in order to remain enrolled at WVU.

Transfer students with less than 70 hours of credit who have not completed the specified courses and/or have not attained the stipulated

grade-point average will be enrolled in the General Forestry curriculum until the basic requirements of the curriculum in which he or she plans to major have been fulfilled. However, the 70 credit-hour maximum rule applies (see paragraph 2, above).

General Forestry students *will not* be allowed to enroll in any Division of Forestry course which bears the prerequisite *forestry major or consent.*

To determine the grade-point average to qualify for admission to a Division of Forestry major, the course grades for college work attempted at *all* schools attended will be used.

Transfer Credits for Professional Courses

Students transferring to the Division of Forestry from one- or two-year technical schools or from four-year unaccredited forestry schools must take an advanced standing examination to demonstrate proficiency for any required professional course offered by the Division of Forestry for which transfer credit is sought. This rule also applies to courses in dendrology and surveying. Advanced standing examinations are given after the student is enrolled in the Division of Forestry. All other credits are accepted subject to the regulations of the Office of Admissions and Records regarding transfer of credits.

Bachelor of Science in Forestry

WOOD INDUSTRIES CURRICULUM

Wood Industries majors take a course of study of 138 credit hours with emphasis in management, production, or science. Graduates in the management and production option are sought by a variety of wood product manufacturers. Job opportunities are available in procurement, management, production, quality control, marketing and research and development with both primary and secondary wood product industries. The science option prepares the student for graduate study in wood science.

Students who wish to major in Wood Industries must have earned at least 30 hours of college credit with a grade-point average of 2.0 or better. The 30 hours must include 6 hours of English (English 1 and 2); 8 hours of chemistry (Chem. 11 and 12 or equiv.); 4 hours of biology; and 6 hours of mathematics through college algebra and trigonometry. (*Note:* Math. 2, Algebra, will not be counted toward graduation requirements. Math. 14, Pre-Calculus, will satisfy basic mathematics requirements.)

Curriculum Requirements	*Hours*
Entrance	30
Biology 51, 52—Dendrology—Angiosperms, Gymnosperms	4
Civil Engineering 1—Surveying	2
Statistics 101 or Economics 125	3
Computer Science 1 *or* 5	4
Economics 54, 55—Principles of Economics	6
Mathematics 15—Calculus	4
Physics 1—Introductory Physics	4
Forest Management 12, 122, 211, 233 *or* 234	14-15
Wood Science 123, 132, 134, 141, 200, 201, 240, 260, 262	26
Core electives	18
Restricted electives	23-22
Total	138

Bachelor of Science in Forestry

FOREST RESOURCES MANAGEMENT CURRICULUM

Students who major in Forest Resources Management take a course of study of 138 credit hours. Students may use elective hours to develop additional professional competence in specialized areas; advisers will provide lists of recommended elective courses suitable for developing specialization.

With the growing demand for forest products and the increasing public consciousness of the value of wildlands for recreation, watershed protection, and aesthetics, career opportunities for professionals are expanding. Graduates in this field have a wide range of potential employment opportunities, including federal and state agencies, and private industry.

Students who wish to major in Forest Resources Management must have earned at least 30 semester hours of college credit with a grade-point average of 2.0 (C) or higher (4.0 possible). The 30 hours must include the following basic courses: 6 hours of English Composition (Engl. 1 and 2); 8 hours of Inorganic Chemistry (Chem. 11 and 12 or equiv.); 8 hours of General Biology (Biol. 1 and 3 and 2 and 4); 6 hours of Mathematics—College Algebra and Trigonometry (Math. 3 and 4). (*Note:* Math. 2, Algebra, will not be counted toward graduation requirements. Math. 14, Pre-Calculus, will satisfy basic mathematics requirements.)

The basic courses and grade-point average specified above must be earned by the time the student has completed 70 hours of college credit; if not, the student cannot be admitted to the Forest Resources Managment major.

Curriculum Requirements	*Hours*
Entrance	30
Agronomy 10—Forest Soils	3
Biology 51 and 52—Dendrology—Angiosperms, Gymnosperms	4
Civil Engineering 5—Land Surveying	4
Economics 54 and 55—Principles of Economics	6
English 105 or 108—Business English or Advanced Comp.	3
Entomology 152 or Plant Pathology 153	3
Forestry 1,* 220, and 226	6
Forest Management 12, 122, 151, 200, 201, 211, 230, 233	27
Forest Hydrology 244	3
Mathematics 15—Calculus	4
Oral Communication	3
Recreation and Parks elective	3
Statistics 101—Elementary Statistical Inference	3
Wildlife Management 131	3
Wood Science 121 and 132	6
Core A, not elsewhere covered	6
Core B, not elsewhere covered	6
Electives	15
Total	138

*Students in the general curriculum should take Forestry 1 during the freshman year.

Restricted Electives and Areas of Emphasis

Part of the 28-29 hours of restricted electives can be selected by the student with the adviser's consent, according to the student's interest.

However, the student must select one of the following three areas of emphasis and take all those courses listed under that area:

Management—

Requirements	*Hours*
Accounting 51, 52—Principles of Accounting	6
Management 105—Management Process	3
Marketing 111—Marketing	3
Finance 111—Business Finance	3
Wood Science 234	3

Production—

Requirements	*Hours*
Industrial Engineering 140, 277	6
Wood Science 231, 232, 234, 251	12

Science—

Requirements	*Hours*
Chemistry 133, 135—Organic Chemistry and Laboratory	4
Mathematics 16—Calculus	4
Physics 2—Introductory Physics	4
Mechanical and Aerospace Engineering 41, 43—Statics and Mechanics of Materials	6

Bachelor of Science in Recreation

RECREATION AND PARKS MANAGEMENT CURRICULUM

The Recreation and Parks Management curriculum consists of 134 hours and is designed to prepare students for a wide variety of professional recreation and parks responsibilities in local, state, and federal agencies; commercial recreation enterprises; private and voluntary agencies; land managing agencies; and those serving special populations. The program options provide each student with a measure of specialization in either administration and planning, interpretation, program leadership, therapeutic recreation, or wildlands management. Discrete use of free electives permits further specialization. An information booklet describing the various options is available from the Recreation and Parks Management Office, 329 Percival Hall, and should be consulted before scheduling courses.

Completion of 30 hours of college credit with a cumulative grade-point average of 2.25 is necessary to gain admittance to the program. The 30 hours must include 6 hours of English composition; 8 hours of natural science; 6 hours of mathematics (college algebra, trigonometry, calculus, finite math, statistics, or computer science); and 3 hours each of economics, psychology, and sociology and anthropology. Selection of specific courses should be made in relation to the program option. (*Note:* Credit for Math. 2, Algebra, will not count as credit earned for degree requirements.)

Students may enroll in Rc. & Pk. 43, Leisure and Human Behavior, and Rc. & Pk. 44, Introduction to Recreation and Park Services, concurrent with semesters during which the 30-hour entrance requirement is being met.

All majors, at the end of the junior year, must complete an approved, full-time internship of not less than 8 weeks with a recreation agency. This may be undertaken at any time during the year.

Curriculum Requirements	*Hours*
Entrance	30
Recreation and Parks 43, 44, 202, 272, 251/263, 233/235/271	19
Recreation and Parks electives	6
Restricted and Core electives	64
Free electives	15
Total	134

Options or Areas of Emphasis

The program of study provides for five areas of emphasis (options): administration and planning, interpretation, program leadership, therapeutic recreation, and wildland recreation management. Each option is developed from a core of recreation classes which establishes a basic professional proficiency in one of the five options. Additional competencies may be developed through the careful selection of electives.

Administration and Planning—The goal of this option is to qualify people for positions of increasing responsibility as administrators, managers, and planners of parks, recreation centers, or systems. In order to manage resources and people, the recreation professional needs a broad background in the physical and social sciences as well as the arts. In addition to recreation classes, students take courses in the arts, economics, forestry, geography, political science, physical education, psychology, and sociology and anthropology. Professional competence is grounded in attaining an understanding of the role and function of recreation in contemporary society and is deepened by experiences both within and outside the curriculum.

Interpretation—The Interpretation Option is concerned with environmental, cultural, and historical information that assists people to understand more clearly their relationship to a changing world, and to communicate that understanding to others. Restricted electives introduce the student to the particular skills necessary for the preparation and presentation of interpretive materials. Course work is taken in biology, communications, forestry, geology, history, and wildlife management. The principal employers are the federal land-managing agencies, state and local recreation and parks departments, school systems, museums, and private recreational enterprises.

Program Leadership—The Program Leadership Option focuses on the planning, leading, and supervising of recreation programs for a variety of clienteles: community and commercial recreation agencies, youth serving organizations, and recreation centers. Restricted electives develop the student's understanding of people and their leisure-time pursuits. These courses are selected from art, music, physical education, psychology, and sociology and anthropology. Students have an opportunity to observe and be involved in local recreation programs.

Therapeutic Recreation—The Therapeutic Recreation Option is an extension of Program Leadership. Learning to plan and provide services for a variety of special populations is the focus of this specialty. Students prepare to work with the physically and/or mentally handicapped, law offenders, and the elderly. Principal employers are community agencies, rehabilitation centers, hospitals, correctional facilities, nursing homes, schools, and camps. Community agencies and the WVU Medical Center provide settings for observation and practical experiences.

Wildland Recreation Management—This option prepares individuals for positions concerned with outdoor recreation in forested settings. In addition

to recreation classes, students complete course work in natural resources (forestry, wildlife, environmental), behavioral sciences, political science, economics, and management. Although primary attention is placed upon recreation in wildland settings, there is sufficient flexibility to permit students to emphasize applied outdoor recreation management, general environmental studies, or preparation for graduate school in resource-related fields.

Bachelor of Science

WILDLIFE RESOURCES CURRICULUM

Wildlife Resources majors take a program of study of 136 hours in preparation for professional positions as game and fish biologists, wildlife managers, planners of wildlife conservation programs, or specialists in communicating with the public agency, and in a wide range of positions because of the breadth of the graduate's background in ecology.

Thirty hours of college credit with a grade-point average of 2.25 or better is required for admission to the program. The 30 hours must include 6 hours of English; 8 hours of chemistry (Chem. 11 and 12 or equiv.); 8 hours of biology; and 6 hours of mathematics through college algebra and trigonometry. (Math. 14, Pre-Calculus Mathematics, fulfills the mathematics requirements.) (*Note:* Credit for Math. 2, Algebra, will not count as credit earned for degree requirements. Math. 14, Pre-Calculus, will satisfy basic mathematics requirements.)

The basic courses and grade-point average specified above must be earned by the time the student has completed 70 hours of college credit; if not, the student cannot be admitted to the Wildlife Resources major.

Curriculum Requirements	*Hours*
Entrance	30
Chemistry 131—Organic Chemistry	4
Mathematics 128—Introduction to Calculus	4
Economics 54—Principles of Economics	3
Computer Science 1—Introduction to Computer Science	3
Agronomy 2 or 10	3-4
Oral Communication	3
Statistics 101—Elementary Statistical Inference	3
Genetics 171—Principles of Genetics	4
Political Science	3
Animal Physiology 100—Intro. to Phys. of Domestic Animals	3
Wildlife Management 213, 224, 228, 231,* 234*	16
Core electives	15
Restricted electives	29
Free electives	12-13
Total	136

*Students interested in fisheries will take limnology, ichthyology, or other approved courses in aquatic ecology, in lieu of W. Man. 231 and 234.

Restricted Electives and Areas of Emphasis

The wildlife resources program provides for five areas of emphasized study: wildlife science, wildlife management, fisheries science, communications, and planning. The student, consulting with the adviser in selection of

courses, will use the restricted elective hours so as to provide appropriate background in the area chosen for emphasis.

Summer Field Studies

The 6-hour Forest Resources Management Summer Field Practice (F. Man. 200 and 201) consists of two consecutive summer sessions, and is designed for students who have completed the junior year of the Forest Resources Management curriculum. Students live in Morgantown in University or privately owned housing, and travel to the University Forest daily for field studies. The first session provides training in forest surveying, timber estimating, photo interpretation, forest management, and forest recreation. Occasional trips are made to wood-using industries and to other forests to study the management of northern hardwood and spruce types. The second session is a one-week trip to North Carolina where silvicultural and management activities are observed in the Southern Pine Region.

The instructional program in the 4-hour Wood Industry Field Practice (Wd. Sc. 200 and Wd. Sc. 201) consists of a three-week field course in surveying and mensuration followed by a one-week trip to Virginia and North Carolina to observe various commercial wood-using industries. These industries include: lumber, plywood, veneer, particle board, furniture, glue lamination, and preservation.

A Recreation Internship (Rc. & Pk. 202) is required of students who have completed the sophomore year of the Recreation Resources Management curriculum. Eight weeks of full-time supervised professional field work is required of students who have completed the junior year of the recreation curriculum. The summer experiences acquaint students with management of park and recreation enterprises.

Courses of Instruction

Forestry (For.)

1. *Professional Orientation.* I. 1 hr. *(Required only for students who rank as freshmen in forestry.)* Survey of degree options in the Division of Forestry and related career and professional opportunities.

140. *West Virginia's Natural Resources.* I, II, S. 3 hr. Survey of policies and practices in development and use of soil, water, forest, wildlife, mineral, and human resources in West Virginia.

170. *Problems in Forestry, Wood Science, Wildlife, or Recreation.* I, II, S. 1-4 hr. PR: Forestry senior or consent.

220. *Forest Policy and Administration.* I and II. 3 hr. PR: Upperclass forestry major or consent. Forest policy in the United States; important federal and state laws; administration of public and private forests; problems in multiple-use forestry.

226. *Remote Sensing of Environment.* II. 2 hr. PR: Math. 3, 4. Measurement and interpretation of natural resources and environment from photography, radar, infrared, and microwave imagery.

233. *Principles of Industrial Forestry.* I. 3 hr. PR: Forestry senior or consent. Analysis and case studies of problems pertinent to the integration of wood conversion technology with principles of production, marketing, and management.

310. *Biometeorology.* II. 4 hr. PR: Consent. A description of the physical environment of plants and its effect on growth, its modification for increasing yield and for plant protection against extreme atmospheric conditions.

Forest Hydrology (F. Hyd.)

41. *Environmental Influences in Forestry.* I. 3 hr. PR: Phys. 1, 2. An introduction to the influences of forests and forestry practices on physical processes that affect the environment.

243. *Forest Water Quality.* I. 3 hr. PR: Forestry major or consent. Influences of natural forest cover, forest land uses, and harvesting practices on selected water quality parameters that can be detected in simple field and laboratory tests.

244. *Watershed Management.* II. 3 hr. PR: F. Man. 12, 211. *(Primarily for forest management majors.)* Influences of silvicultural practices and forest management activities on the hydrology of forested catchments.

Forest Management (F. Man.)

12. *Forest Ecology.* I, II. 3 hr. PR: Biol. 51. Forest and environment factors; site and type characteristics.

122. *Forest Mensuration.* II. 4 hr. PR: Math. 15, Stat. 101. Estimating volume and growth of trees and forest stands with emphasis on the mathematical and statistical techniques involved. Laboratories include practical field experience.

132. *Farm Woods Management.* II. 3 hr. Students majoring in forest resource management and wood industry may not take this course for credit. Characteristics of forest trees; management of farm woods for timber, wildlife, watershed protection, and recreation; measuring and marketing farm timber; plantation establishment.

151. *Forest Fire Protection.* I. 2 hr. Prevention, detection, and control of wildfires. Forest fuels, fire weather, and wildfire behavior. Use of fire for forest management purposes.

200. *Forest Measurement, Interpretation, Wildlife Management.* S. 5 hr. PR: Biol. 51; C.E. 5; F. Man. 122. *(Course will be taught during four consecutive 6-day weeks.)* Application and study of forest resources practice with emphasis on field problems.

201. *Forest Resources Management Southern Trip.* S. 1 hr. PR: F. Man. 200 or consent. One-week trip to the Southern Pine Region to observe forest management practices on private and public lands.

211. *Silvicultural Systems.* I. 4 hr. PR: Forestry major or consent; F. Man. 12. Principles of regeneration cuttings, intermediate cuttings, and cultural operations, with their application of forest stands.

213. *Regional Silviculture.* I. 2 hr. PR: Forestry major or consent. F. Man. 12; PR or Conc.: F. Man. 211. Major forest types of the United States: their composition, management, problems, and silvicultural treatment.

215. *Principles of Artificial Forestation.* II. 3 hr. PR: Forestry major or consent; F. Man. 12. Seeding and planting nursery practice; phases of artificial regeneration.

216. *Forest Genetics and Tree Improvement.* II. 3 hr. PR: Forestry major or consent; Gen. 272, or equiv., or consent. Forest genetic principles and their application to forest tree improvement, including crossing methods, selection systems, and other techniques.

222. *Advanced Forest Mensuration.* II. 3 hr. PR: Forestry major or consent; F. Man. 122. Measurement of growth and yield; statistical methods applied to forest measurement problems.

230. *Principles of Forestry Economics.* II. 3 hr. PR: Forestry major or consent; Econ. 51 and 52 or equiv. Production, distribution, and use of forest goods and services. Emphasis on analytical methods and techniques dealing with forest economic problems.

232. *Forest Finance.* II. 2 hr. PR: Forestry junior standing or consent. Interest, discount, and rate earned, in forest production and exploitation. Particular reference to determining value of standing timber, appraisal of forest damages, and forest taxation.

233. *Forest Management.* I. 4 hr. PR: Summer Camp; PR or Conc.: Forestry major or consent; F. Man. 211. Principles of sustained yield forest management. Organization of forest areas, selection of management objectives, application of silvicultural systems, and regulation of cut. Forest management plan.

234. *Forest Resources Management Planning.* I, II. 3 hr. PR: Forestry major or consent; senior standing. Analysis and planning for management of forest resources. Development of a management plan for an actual forest tract.

330. *Advanced Principles of Forestry Economics.* I. 3 hr. PR: Econ. 51 or equiv.; F. Man. 230 or equiv. Intensive study of both micro- and macroeconomics of forestry.

Wood Science (Wd. Sc.)

121. *Wood Technology.* II. 3 hr. PR: Biol. 51. For students other than those taking the wood industries and wood science options; designed to provide familiarity with the technical aspects of wood utilization.

123. *Wood Identification.* I. 3 hr. PR: Wood Industry major or consent; Biol. 51. Identification of commerical timbers of the U.S.; basic properties and uses of different woods.

132. *Primary Conversion and Grading.* II. 3 hr. PR: Forestry major or consent. Principles of the conversion of raw materials in log form to primary wood products. Elements of the grading of raw materials and primary products. Production planning and control.

134. *Secondary Manufacturing Processes.* II. 3 hr. PR: Wd. Sc. 123 or consent. Detailed study of the materials and processes involved in manufacture of secondary wood products.

141. *Properties of Wood.* I. 3 hr. PR: Wood Industry major or consent; Phys. 1, Wd. Sc. 123. Physical and mechanical properties of wood.

200. *Forest Measurement Field Practice.* S. 3 hr. PR: Wood Industry major, Biol. 51, C.E. 1, F. Man. 122. Application of surveying and mensurational practices with emphasis on field problems.

201. *Wood Industries Field Trip.* S. 1 hr. PR: Wd. Sc. 134. A one-week trip to observe manufacturing methods and techniques of commerical wood industry plants. Plants visited include furniture, plywood, veneer, hardboard, particle board, pulp and paper, sawmilling, and preservation.

230. *Wood Machining.* I. 2 hr. PR: Consent. Introduction to basic concepts of wood machining with emphasis on production equipment and furniture manufacturing.

231. *Wood Finishing.* I. 3 hr. PR: Wd. Sc. 121 or 123. Surface preparation, composition of finishing materials, equipment, techniques, defects, troubleshooting, and quality control.

232. *Wood Adhesion: Theory and Practice.* I. 2 hr. PR: Wd. Sc. 123 and 141. Detailed theoretical introduction and examination of different types of adhesives and gluing techniques used in the wood industry.

234. *Statistical Quality Control.* I. 3 hr. PR: Forestry major or consent; Wd. Sc. 134. Methods used to control quality of manufactured wood products. Control charts of variables and attributes. Acceptance sampling techniques.

235. *Light-Frame Wood Construction.* I. 2 hr. PR: Forestry major or consent. Use of wood in light-frame construction. Basic design procedures and construction methods.

240. *Wood Moisture Relationships.* II. 3 hr. PR: Wd. Sc. 123. Principles involved in the relation between wood and moisture, and purposes, effects, and methods of seasoning.

251. *Forest Products Protection.* II. 3 hr. PR: Wd. Sc. 123, 134. Biological organisms responsible for deterioration of wood products, their control by preservative methods, and study of fire retarding methods.

260. *Plant Layout for Wood Industries.* II. 3 hr. PR: Senior standing. Relates knowledge of wood product processes to optimize production. Study of proper arrangement of machines, and work and storage areas.

262. *Forest Products Decision-Making.* I. 3 hr. PR: Junior standing in Forestry. Decision-making tools and techniques used by the forest products industry such as simulation-linear programming, network analysis, forecasting, game theory.

320. *Wood Microstructure.* I. 3 hr. PR: Wd. Sc. 123; senior standing. Detailed examination of wood microstructure as it relates to processing, behavior, and identification.

340. *Advanced Physical Behavior of Wood.* I. 3 hr. PR: Wd. Sc. 240 or equiv. or consent. Physical relationships of water and wood; fluid flow through wood; thermal, electrical, and acoustical behavior of wood. Theories of wood drying and their application.

362. *Forest Products Operations Research Models.* II. 3 hr. PR: Wd. Sc. 262 and demonstrated knowledge of Fortran and Basic, or consent. Analysis of operations research models currently used by the forest products industry. Students will develop new models. *(Offered in Spring of even years.)*

Wildlife Management (W. Man.)

121. *Interpretive Bird Study.* II. 3 hr. PR: Biol. 2 and 4 or consent. Intensive field studies in recognition through sight, song, and behavioral patterns of birds, and their ecology in the Central Appalachians. 2 hr. lec., 2 hr. lab.

131. *Wildlife Management.* I. 3 hr. PR: Biol. 2 and 4 *(Students majoring in wildlife management may not take this course for credit.)* Basic principles of handling wildlife as a forest crop, including population of dynamics, ecological relationships, social behavior, habitat manipulation, and game administration.

151. *Attitudes Toward Wildlife.* II. 3 hr. A consideration of our changing perception of and relationships toward wild animals.

213. *Wildlife Ecosystem Ecology.* I. 3 hr. PR: Biol. 1 and 3, 2 and 4, and 51 or consent. Basic principles of ecosystem ecology, emphasizing structure and function, succession, adaptation of organisms to the environment (physiological ecology), and survey of major ecosystems with emphasis on their roles as wildlife habitats.

214. *Wildlife Population Ecology.* II. 3 hr. PR: W. Man. 213 or consent. Emphasis on theoretical and applied population ecology including population growth, interactions, regulation, and effects of harvesting and exploitation on natural populations. 2 hr. lec., 1 hr. lab.

224. *Vertebrate Natural History.* I. 3 hr. PR: Biol. 2 and 4 or consent. Relationships of fish, amphibians, and reptiles to the forest, with emphasis on the ecology, taxonomy, evolution, natural history, and field identification of these groups. Laboratory emphasizes natural history and anatomy of fish, amphibians, and reptiles.

225. *Mammalogy.* II. 3 hr. PR: Biol. 2 and 4 or consent. Relationships of mammals to the forest, with emphasis on ecology, taxonomy, evolution, natural history, and anatomy of mammals. Laboratory emphasizes natural history and anatomy of mammals.

226. *Ornithology.* II. 3 hr. PR: Biol. 1 and 3, 2 and 4, or consent. Identification, distribution, and ecology of birds (particularly of forest lands). 2 hr. lec., 1 hr. lab.

228. *Wildlife Policy and Administration.* II. 3 hr. Study of the organization, authority, policies, programs and administration of public agencies and private organizations concerned with fish and wildlife. Emphasis is on the legal and political role in making wildlife management decisions.

231. *Wildlife Techniques.* I. 3 hr. PR: Wildlife major or consent; W. Man. 213, Biol. 51. Field and laboratory techniques necessary in management and study of wildlife; collection of field data, mapping, censusing, habitat evaluation, literature and scientific writing.

234. *Principles of Wildlife Management.* II. 3 hr. PR: Wildlife major or consent; W. Man. 213, 231. Major game animals and problems and principles involved in their management.

312. *Advanced Wildlife Population Ecology.* II. 3 hr. PR: W. Man. 214, or equiv. or consent. Case history approach to wildlife population ecology with emphasis on ungulates, gallinaceous birds, large predators; forest invertebrates and their vertebrate predators; endangered species; genetics and conservation of wildlife populations. Emphasis on current and historical literature.

333. *Quantitative Ecology.* I. 3 hr. PR: Stat. 311 or equiv., and W. Man. 213 or equiv. A survey of techniques and strategies for the quantitative analysis of complex ecological data sets. *(Offered in Fall of odd years.)*

370. *Wildlife Seminar.* II. 1 hr. per sem.; (4 hr. max.). PR: Consent. Discussion of current developments in wildlife management.

380. *Rural and Urban Wildlife Management.* II. 3 hr. PR: Consent. Management of nongame wildlife in the rural and urban environment, emphasizing habitat improvement and development and control of pest species. 2 hr. lec., 1 hr. lab. *(Offered in Spring of odd years.)*

Recreation and Parks (Rc. & Pk.)

43. *Leisure and Human Behavior.* I. 3 hr. An interdisciplinary approach analyzing the role of leisure in modern American life. Play, games, work, and recreation are studied as aspects of human behavior affected by global, physical, societal, and personal concerns.

44. *Introduction to Recreation and Park Services.* II. 4 hr. An overview of recreation in modern life: its philosophy, environments, historical antecedents, service delivery systems, special settings and populations, leadership, program, and professional challenges. Includes a field placement with a local recreation agency.

56. *Nature Recreation and Camping.* I. (Alternate Years.) 3 hr. Lecture and workshop. Introduction to organized camping movement including purposes, campsites, equipment, programs, and leadership. Exploration of nature recreation and its relationship to community recreation and camping programs.

57. *Social Recreation.* II. 3 hr. Lecture and workshop course. Place of social recreation activities, informal dramatics, crafts, and music in community center, playground, camp or school extracurricular programs.

100. *Approved Summer Park Experience and Report.* S. 1 hr. PR: Recreation and parks junior or consent. One summer's experience in management of a park or related recreational enterprise followed by a written report.

142. *Fundamentals of Nature Interpretation.* II. 3 hr. PR: Recreation and parks junior or consent. Methods and techniques of interpreting the natural environment to individuals and groups.

202. *Recreation Internship.* I. 3 hr. PR: Rc. & Pk. 43, 44, 251/263, 233/235/271. Supervised, full-time leadership responsibility with a recreation agency for a minimum of eight weeks. Program must relate to the student's curriculum option and must be approved in advance by the program coordinator.

203. *Professional Synthesis.* I, II. 3 hr. PR or Conc.: Rc. & Pk. 202. A capstone course for seniors that involves the synthesizing of professional training and field work experiences.

216. *Philosophy of Recreation.* II. 3 hr. PR: Consent. Interpretation of recreation as a basic part of the living process; importance to individual community and national welfare; social and economic significance.

224. *Outdoor Recreation in Modern Society.* II. 3 hr. PR: Consent. Emphasis on the physical, social, and psychological implications of areas and activities. Content ranges from wilderness areas to urban parks. Related research is reviewed, a current issue debated, and a new activity or skill experienced.

233. *Wildland Recreation Management.* I. 3 hr. PR: F. Man. 12 or consent. Topics include an analysis of administrative agencies concerned with wildland management; methods of ameliorating human impact on outdoor recreation resources; discussion of philosophies underlying wilderness recreation; and a review of contemporary controversies concerning wildlands. 2 hr. lec., 1 hr. lab.

234. *Wilderness in American Society.* II. 3 hr. PR: Rc. & Pk. 233 or consent. A seminar examining political, sociological, and environmental aspects of American wilderness. A discussion on articles concerning wilderness preservation, management, and aesthetics.

235. *Administration of Urban Recreation Services.* I. 3 hr. PR: 12 hr. of recreation and parks courses or consent. Principles of administration as applied to the operation of recreation and park agencies, including legal foundations, policy, organization, personnel, finance and programs of services.

241. *Recreational Services for Special Populations.* I. 3 hr. PR: Consent. Introductory analysis of current therapeutic recreation services; attentiveness to the need for broadening recreation and park services to include members of special populations; familiarization with the planning consideration for the conduct of such services.

242. *Historical and Cultural Interpretation.* II. 3 hr. PR: Recreation and parks major or consent. Methods of locating source materials for reconstructing the historical, cultural, and physical aspects of an area for an interpretive center; preparing brochures, displays, and nature trails to facilitate interpretive activities.

248. *Environmental Concerns In Outdoor Recreation.* I. 3 hr. PR: Consent. Understanding and interpreting environmental concerns within the context of outdoor recreation.

251. *Recreation Leadership.* I. 3 hr. PR: Recreation and parks major or consent. Leadership functions and techniques, group dynamics, supervision, and use of volunteers. Theory and practice are related through a field placement with a local recreation agency.

263. *Program Planning.* II. 3 hr. PR: Recreation and parks major or consent. Fundamentals for general program planning; considers needs, facilities, age groups, local customs, climatic factors, etc. Planning involved in playgrounds, indoor centers, playfields, parks, hospitals, voluntary agencies, industry, and campus.

265. *Planning and Design of Recreation Places.* II. 3 hr. PR: Recreation and parks major or consent. Study of planning and design concepts, standards and guidelines, use continuum, grants-in-aid, and planning of selected areas and facilities: parks, pools, centers, and recreation resource areas development.

271. *Administration of Camping Services.* II. 3 hr. PR: Recreation and parks major or consent. Principles involved in modern camping programs, and organization and administration of camps.

Division of Plant and Soil Sciences

Faculty

Professors

Fred B. Abeles, Ph.D. (U. Minn.)—*Adjunct.* Plant Physiology.
Robert E. Anderson, Ph.D. (U. Wisc.)—*Extension.* Agricultural Microbiology. Food microbiology, Environmental education.
Barton S. Baker, Ph.D. (WVU). Agronomy. Forage crops.
John A. Balasko, Ph.D. (U. Wisc.) Agronomy. Forage crops.
John F. Baniecki, Ph.D. (U. Ariz.). *Extension.* Plant Pathology. Plant disease identification and control.
H. L. Barnett, Ph.D. (Mich. St. U.)—*Emeritus.* Mycology.
Joseph G. Barratt, Ph.D. (U. N.H.). Plant Pathology. Tree fruit diseases.
Bradford C. Bearce, Ph.D. (U. Calif.). Horticulture. Florist and nursery crops.
Orus L. Bennett, Ph.D. (WVU)—*Adjunct.* Agronomy.
Gary K. Bissonnette, Ph.D. (Mont. St. U.). Agricultural Microbiology. Aquatic microbiology, Environmental microbiology.
Steven H. Blizzard, Ph.D. (WVU). Horticulture. Tree fruits.
Linda Butler, Ph.D. (U. Ga.). Entomology. Forest entomology, Pest management, Lepidoptera.
Billy A. Butt, B.S. (Purdue U.)—*Adjunct.* Entomology.
Edward S. Elliott, Ph.D. (WVU). *Emeritus.* Plant Pathology.
Mannon E. Gallegly, Jr., Ph.D. (U. Wisc.)—*Chair.* Plant and Soil Sciences. Plant pathology, Vegetable diseases.
Frank W. Glover, Jr., B.S. (WVU)—*Adjunct.* Agronomy.
Edward Hacskaylo, Ph.D. (Geo. Wash. U.)—*Adjunct.* Mycology.
Dale F. Hindal, Ph.D. (Iowa St. U.). Mycology. Fungal physiology, Mycorrhizae, Biocontrol and diseases of forest and shade trees.
L. Morris Ingle, Ph.D. (Purdue U.). Horticulture. Post-harvest physiology of tree fruits.
Walter J. Kaczmarczyk, Ph.D. (Hahnemann Med. C.). Genetics. Biochemical genetics.
Robert F. Keefer, Ph.D. (Ohio St. U.). Agronomy. Soil fertility, Organic matter, Soil conservation.
Francis M. Latterell, Ph.D. (Iowa St. U.)—*Adjunct.* Plant Pathology.
Virgil G. Lilly, Ph.D. (WVU)—*Emeritus.* Mycology.
William L. MacDonald, Ph.D. (Iowa St. U.). Plant Pathology. Forest and shade tree diseases.
Joginder Nath, Ph.D. (U. Wisc.). Genetics. Cytogenetics, Evolution, Mutagenesis.
G. Gordon Pohlman, Ph.D. (Iowa St. C.)—*Emeritus.* Agronomy.
David O. Quinn, M.S. (WVU)—*Coordinator for Pesticide Applicator Training, Extension Specialist.* Plant Pathology. Safe use of pesticides.
Oscar E. Schubert, Ph.D. (U. Ill.)—*Emeritus.* Horticulture.
Rabindar N. Singh, Ph.D. (VPI&SU). Agronomy. Soil chemistry and mineralogy.
Richard M. Smith, Ph.D. (Ohio St. U.)—*Emeritus.* Agronomy.
Charles B. Sperow, Jr., M.S. (WVU)—*Extension.* Agronomy. Crops agronomy.

David A. Stelzig, Ph.D. (N.D. St. U.). Agricultural Biochemistry. Biochemical plant pathology.
R. Philip True, Ph.D. (U. Penn)—*Emeritus*. Plant Pathology.
Valentin Ulrich, Ph.D. (Rutgers U.). Genetics. Biochemical genetics, Plant breeding.
Tom van der Zwet, Ph.D. (L.S.U.)—*Adjunct*. Plant Pathology.
Willem A. van Eck, Ph.D. (Mich. St. U.)—*Extension Specialist—Soil Science*. Soil and water resources.
Collins Veatch, Ph.D. (U. Ill.)—*Emeritus*. Agronomy.
William V. Welker, Jr., Ph.D. (U. Wisc.)—*Adjunct*. Horticulture.
Charles L. Wilson, Ph.D. (WVU)—*Adjunct*. Plant Pathology.
Harold A. Wilson, Ph.D. (Iowa St. C.)—*Emeritus*. Bacteriology.
Robert J. Young, Ph.D. (Ore. St. U.). Plant Pathology. Vegetable diseases.
Richard K. Zimmerman, Ph.D. (WVU)—*Extension*. Plant Sciences. Plant sciences and conservation.

Associate Professors

James W. Amrine, Jr., Ph.D. (Iowa St. U.). Entomology. Medical entomology, Apiculture, Biological control.
James L. Brooks, Ph.D. (U. Calif.). Agricultural Biochemistry. Enzymes, Plant biochemistry.
William B. Bryan, Ph.D. (Iowa St. U.). Agronomy. Pastures.
Edwin Gould, B.S. (WVU)—*Emeritus*. Entomology.
Henry W. Hogmire, Ph.D. (Mich. St. U.). Entomology. Tree fruit entomology, Integrated pest management.
Everett M. Jencks, Ph.D. (Rutgers U.). Agronomy. Soil chemistry.
Stephen S. Miller, Ph.D. (WVU)—*Adjunct*. Horticulture.
Tong-Man Ong, Ph.D. (Ill. St. U.)—*Adjunct*. Genetics.
John C. Sencindiver, Ph.D. (WVU). Agronomy. Soil science, Soil genesis and classification, Acid mine drainage/mine land reclamation.
Suman Singha, Ph.D. (Cornell U.). Horticulture. Tree fruits, Micropropagation.
William G. Sorenson, Ph.D. (U. Tex.)—*Adjunct*. Genetics.
Roger S. Young, Ph.D. (Mich. St. U.). Horticulture. Tree fruits, Weed science.

Assistant Professors

Edward N. Ashworth, Ph.D. (U. Md.)—*Adjunct*. Horticulture.
Tara Baugher, Ph.D. (WVU)—*Extension*. Horticulture. Tree fruits.
Douglas G. Boyer, Ph.D. (WVU)—*Adjunct*. Agronomy.
Mark W. Brown, Ph.D. (Penn St. U.)—*Adjunct*. Entomology.
James L. Hern, Ph.D. (WVU)—*Adjunct*. Agronomy.
Clinton E. Hickman, M.S. (WVU). Horticulture. Vegetables, Small fruits.
John F. Holtz, B.S. (U. Md.)—*Adjunct*. Meteorology.
James B. Kotcon, Ph.D. (U. Wisc.). Plant Pathology. Nematology, Soil-borne diseases.
Manfred E. Mielke, M.S. (U. Idaho)—*Adjunct*. Plant Pathology.
Joseph B. Morton, Ph.D. (Mont. St. U.). Plant Pathology. Mycorrhizal interactions, Field crop diseases.
Ralph S. Scorza, Ph.D. (Purdue U.)—*Adjunct*. Horticulture.
Tom Staley, Ph.D. (Ore. St. U.)—*Adjunct*. Agricultural Microbiology.
Alan J. Sexstone, Ph.D. (Mich. St. U.). Agricultural Microbiology. Nutrient cycling, Biodegradation of pollutants.
Joseph E. Weaver, M.S. (WVU). Entomology. Bionomics, Control of insects.
Walter M. Winant, M.S. (U. Md.)—*Adjunct*. Agronomy.
Sara E. Wright, Ph.D. (Tex. St. U.)—*Adjunct*. Bacteriology.

Bachelor of Science in Agriculture

PLANT AND SOIL SCIENCES CURRICULUM

Students enrolled in this degree program may select courses to develop interest areas in *agronomy, horticulture, soil science, environmental protection,* or *basic science* to prepare for positions involving various phases of commercial crop production and use, soil conservation, pedology and soil

survey, land reclamation and revegetation, land management and classification, fertilizer use, weed control, insect and disease control, plant breeding, farm management, and turf and golf course maintenance. Graduates may be self employed or develop careers with commercial industries involved with the development and distribution of pest-control chemicals, fertilizers, seeds and plants, and nursery, floral, garden, and turf products. Also, positions as estate and farm managers, land reclamationists, city and county planning technicians, park, and golf course superintendents, and environmental protectionists are available to graduates of this program, as well as many different positions with state and federal governmental agencies.

By judicious selection of courses the student may also acquire the necessary background in the *basic sciences* to enter professional or graduate programs of study in such fields as agricultural biochemistry, crop science, entomology, genetics, horticulture, mycology, plant pathology, and soil science.

For all students in the curriculum in Agriculture the program of courses taken in the freshman year is essentially the same. However, students are urged to select the appropriate adviser so that they may develop their program of study in one of the areas described above while meeting the requirements for the curriculum:

Curriculum Requirements	*Hours*
English Composition and Rhetoric (or conformity with University English requirements)	6
Arts and Humanities (Group A)	12
Social and Behavioral Sciences (Group B)	12
Natural Sciences (Group C included)	24
(Must elect a minimum of 8 hours in biology; 8 hours in chemistry; 3 hours in college algebra or equivalent.)	
Courses in Agriculture	45
Elect a minimum of 3-credit course, excluding Assigned Topics, in each of the following: 1. Animal Science; 2. Plant Science; 3. Soil Science; and 4. Agricultural Economics. Elect additional courses to obtain a total of 45 hours in Agriculture	
Free Electives*	37
Total	136

*May elect to take courses in Military Science or Air Force Aerospace Studies (ROTC).

Specific requirements for each of the program options are as follows:

Agronomy, Crop Science: Phys. 1, 2; Geol. 1, 2; Gen. 171, 290; Chem. 133, 134, 135, 136; Biol. 169; P. Pth. 201; Ento. 204; Ag. Ec. 206; Econ. 54; Bact. 141. 15 hours of upper-division Agronomy courses.

Agronomy, Soil Science: Phys. 1, 2; Geol. 1, 2, 294; Chem. 133, 134, 135, 136; Biol. 169; Ento. 204; Ag. Ec. 206; Econ. 54; Bact. 141. 15 hours of upper-division Agronomy courses.

Horticulture: Biol. 2 and 4, 169; Chem. 131 or 133, 135; C.S. 1 or 5; Ento. 204; Hort. 107, 204; 6 additional hr. P. Pth. 201; Econ. 54.

Environmental Protection: Chem. 131 or 133, 135; C.E. 251; Ento. 204, 212; Bact. 141, 201; P. Pth. 201; W. Man. 213; Agron. 251; Econ. 54.

Basic Science: Math. 3, 4, 15, 16; Chem. 133, 134, 135, 136; Phys. 1, 2; Biol. 169; Bact. 141; Ag. Bi. 210; Stat. 101; Econ. 54.

Courses of Instruction

Assigned Topics

In order to be eligible to register in Assigned Topics (Pl. Sc. 180) the student must: (1) be in good standing, and (2) obtain approval of the appropriate Division Chairperson before registration (see below).

Agronomy (Agron.)

2. *Principles of Soil Science.* II. 4 hr. PR: Inorganic chemistry. An introduction to soil science. 3 lec., 1 lab.

10. *Forest Soils.* I. 3 hr. PR: Inorganic chemistry. Principles of soil science with particular reference to forest soils. 2 lec., 1 lab.

115. *Soil Judging, Mapping, and Interpretation.* I. 3 hr. PR: Agron. 2 or 10. Techniques in observing and describing soil profiles, mapping by modern systems and interpreting basic soil surveys for varied soil use.

210. *Soil Fertility.* I. 3 hr. PR: Agron. 2 or 10. Soil properties in relation to fertility and productivity of soils; evaluation of soil fertility; production of fertilizers and their use in increasing soil fertility and productivity.

212. *Soil Conservation and Management.* I. 3 hr. PR: Agron. 2 or 10. Using soil technology to solve soil management problems relating to cropping systems. Field diagnosis of soil problems stressed. 2 lec., 2 lab.

230. *Soil Physics.* II. 3 hr. PR: Agron 2 or 10. Physical properties of soils; water and air relationships and their influence on soil productivity. *(Offered in Spring of even years.)*

250. *Turfgrass Management.* I. 3 hr. PR: Agron. 2 or consent. Establishment, maintenance, and adaption of grasses and legumes for lawns, golf courses, parks, athletic fields, and roadsides. Associating differential plant responses with soil, climatic, and biotic factors. *(Field trips arranged.)*

251. *Weed Control.* I. 3 hr. PR: Pl. Sc. 52, Agron. 2, or consent. Fundamental principles of weed control. Recommended control measures for and identification of common weeds. 2 lec., 1 lab. *(Offered in Fall of odd years.)*

252. *Grain and Special Crops.* II. 3 hr. PR: Pl. Sc. 52, Agron. 2, or consent. Advanced study of methods in the production of grain and special crops. Varieties, improvement, tillage, harvesting, storage, and use of crops grown for seed or special purposes. *(Offered in Spring of even years.)*

254. *Pasture and Forage Crops.* I. 4 hr. PR: Pl. Sc. 52, Agron. 2, or consent. All phases of pasture and forage crop production, including identification, seeding, management, use, seed production, and storage of forage crops. 3 lec., 1 lab.

255. *Elements of Pedology.* II. 3 hr. PR: Consent. Pedologic definitions and principles will be applied to advanced planning, practices, and continuing use of highly disturbed or man-made soils being created by such activities as mining and urbanization. *(One all-day field trip required.)*

301. *Geotechnic.* I. 3 hr. PR: Consent. A unified approach to various aspects of soil formation and influence of formative factors on the nature of soils and their use as engineering materials. Course serves as a common meeting ground for students in the various disciplines concerned with earth science. 3 lec. *(Offered in Fall of odd years.)*

315. *Soil Genesis and Classification.* I. 3 hr. PR: Agron. 2 or 10. Origin and formation of soils. Study of soil profiles and soil-forming processes in field and laboratory. Principles of classification and techniques of soil mapping. 2 lec., 1 lab. *(Saturday field trips required.) (Offered in Fall of even years.)*

Bacteriology (Bact.)

141. *General Bacteriology.* I, II. 4 hr. PR: Inorganic chemistry. Introductory morphological, cultural, and physiological characteristics of bacteria; application of bacteriology to agriculture, home economics, sanitation, and health.

201. *Environmental Microbiology.* II. 4 hr. PR: Bact. 141 or consent. Microbiology as applied to soil, water, waste-water, sewage, air, and the general environment. Occurrence, distribution, ecology, and detection of microorganisms in these environments.

347. *Food Microbiology.* I. 4 hr. PR: Bact. 141, biochemistry or consent. Ecology and physiology of microorganisms important in the manufacture and deterioration of foods. Techniques for the microbiological examination of food. *(Offered in Fall of odd years.) (Course will not be offered in 1986-87.)*

348. *Sanitary Bacteriology.* I. 3 hr. PR: Bact. 141. Bacteriology and health hazards associated with food handling, water treatment, and sanitary waste disposal. *(Offered in Fall of even years.)*

Entomology (Ento.)

152. *Forest Entomology.* II. 3 hr. PR: F. Man. 211. *(This course is primarily designed for forestry students.)* Relationships between insects and the forest; recognition and management of important species.

201. *Apiculture.* II. 4 hr. PR: Biol. 1 and 3 and 2 and 4 or consent. Development, physiology, and behavior of the honey bee with emphasis on colony management, pollination, diseases of bees; properties of honey and beeswax. Laboratory emphasizes a study of anatomy, equipment organization, and field management.

204. *Principles of Entomology.* I. 4 hr. PR: Biol. 1 and 3 and 2 and 4 or equiv. Basic course dealing with the anatomy, morphology, physiology, reproduction, systematics, ecology, and management of insects.

210. *Insects Pests in the Agroecosystem.* I. 3 hr. PR: Ento. 204 or consent. Life cycle, damage, and economic impact of pestiferous insects in the agroecosystem. Included are insect pests of agricultural and ornamental plants, stored products, structures, and livestock. 2 lec., 1 lab.

212. *Pest Management.* II. 3 hr. Ento. 204 or consent. An in-depth look at current problems and solutions in controlling insect pests in an environmentally compatible manner. Management techniques include cultural, mechanical, physical, biological, regulatory, and chemical practices. 3 lec.

390. *Special Topics in Entomology.* I, II, S. 2-6 hr. PR: Ento. 204 or equiv., or consent. Each of the following courses is given every other year. Exopterygota; Endopterygota Part I, Part II; Larval Insects; Acarology; Araneology; Pesticides in the Environment; Insect Morphology; Insect Physiology; Medical Entomology.

Genetics (Gen.)

171. *Principles of Genetics.* II. 4 hr. PR: 8 hr. biological science. The fundamentals of inheritance.

290. *Crop Breeding.* II. 3 hr. PR: Gen. 171 or 321. Methods and basic scientific principles involved in improvement of leading crops through hybridization, selection, and other techniques. *(Offered in Spring of even years.)*

321. *Basic Concepts of Modern Genetics.* I. 3 hr. PR: 8 hr. biological science and 1 year chemistry. Independent inheritance, linkage. Chemical nature of genetic material. Control of phenotype by genetic material. Gene action and coding of genetic material.

325. *Human Genetics.* II. 3 hr. PR: Gen. 171 or 321 or consent. Study of genetic system responsible for the development of phenotype in man. *(Offered in Spring of odd years.).*

335. *Population Genetics.* II. 3 hr. PR: Gen. 171 or 321 or consent. Relationship of gene and genotype frequencies in populations of diploid organisms, and effects of mutation, migration, selection, assortive mating, and inbreeding in relation to single gene pairs. Application of these concepts to multigenic inheritance of quantitative traits. *(Offered in Spring of even years.)*

Horticulture (Hort.)

107. *General Horticulture.* I. 3 hr. PR: Biol. 1 and 3, or consent. Principles underlying present-day horticulture practice with special emphasis on how basic discoveries in plant science have been applied in horticulture.

115. *Judging and Identification of Apple Varieties.* I. 1 hr. Two laboratory periods half of semester. Identification and judging of apple varieties. *(Course will not be offered in 1986-87.)*

116. *Flower Judging.* II. 1 hr. One laboratory period per week. Identification and judging of flowers with emphasis on the aesthetic values which underlie desirability in a variety.

117. *Vegetable Identification and Judging.* I. 1 hr. Identification and judging the common vegetables and the test associated with olericulture in West Virginia. Emphasis is placed on the cultural practices associated with top quality vegetables.

151. *Floral Design.* I. 3 hr. Basic course in flower arrangement to cover occasions for the home and retail flower shop.

162. *Herbaceous Plant Materials.* I. 3 hr. Identification, description, adaptability, and evaluation of selected herbaceous annuals and perennials with emphasis on their use as design elements.

204. *Plant Propagation.* II. 3 hr. PR: Pl. Sc. 52 or consent. Study of practices of plant propagation and factors involved in reproduction in plants.

242. *Small-Fruits.* I. 3 hr. PR: Pl. Sc. 52, Hort. 107, or consent. *(One 2-day field trip required.)* Taxonomic, physiological, and ecological principles involved in production and handling of small-fruits. 2 lec., 1 scheduled lab. *(Offered in Fall of odd years; next offering 1987.)*

243. *Vegetable Crops.* I. 3 hr. PR: Pl. Sc. 52 or consent. *(One 3-day field trip required.)* Botanical and ecological characteristics influencing the production of vegetable crops. 2 hr. lec., 1 hr. lab. *(Offered in Fall of even years.) (Offered first time Fall, 1986.)*

244. *Handling and Storage of Horticultural Crops.* I. 3 hr. PR: Pl. Sc. 52, Chem. 16. Characteristics of perishable crops. Methods and materials used to maintain quality. 2 lec., 1 scheduled lab. *(Offered in Fall of odd years.)*

245. *Greenhouse Management.* II. 3 hr. PR: Two semesters of Inorganic Chemistry and Hort. 107 or consent. Greenhouse as a controlled plant environment. How to regulate factors influencing plant growth and development within specialized environments of greenhouses.

246. *Tree Fruits.* I. 3 hr. PR: Pl. Sc. 52 or consent. Principles and practices involved in production of tree fruits. 2 lec., 1 scheduled lab. *(Offered in Fall of even years.)*

301. *Post-Harvest Physiology.* II. 3 hr. Physiology and biochemistry of harvested crops. 1 lec., 2 labs. *(Offered in Spring of odd years.)*

Plant Pathology (P. Pth.)

153. *Forest Pathology.* I. 3 hr. PR: Biol. 2 and 4, F. Man. 211. Important diseases of forest and shade trees. Causes and methods of control.

201. *General Plant Pathology.* I. 4 hr. Nature and causes of plant diseases; methods of control.

301. *Diseases of Economic Plants.* I, II, S. 1-3 hr. per sem.; 2 hr. in Summer. PR: P. Pth. 201 or 303 or consent. Recognition, cause, and control of diseases of economic plants. [Sem. I—Diseases of vegetable crops and of trees and small fruits; Sem. II—Diseases of ornamental plants and field and forage crops; S—Diseases of forest trees. Students may register for 1-3 hr. in Sem. I and II, 2 hr. in Summer, until 8 hours of credit are accumulated.] *(Offered in 1987-88 and in alternate years.)*

302. *Principles of Plant Pathology.* II. 4 hr. PR: P. Pth. 153, 201, or 303, or consent. *(Primarily for graduate students and seniors majoring in biology or agricultural science.)* Nature of disease in plants with practice in laboratory methods. *(Offered in Spring of even years.)*

303. *Mycology.* I. 4 hr. Lectures and field and laboratory studies of parastic and saprophytic fungi.

309. *Nematology.* II. 3 hr. *(Primarily for graduate students majoring in the agricultural sciences or biology.)* Nematode taxonomy, bionomics, and control, with particular emphasis on plant parasitic forms. *(Offered in Spring of odd years.)*

Plant Science (Pl. Sc.)

52. *Principles of Plant Science.* I, II. 4 hr. PR: Biol. 1 and 3. Basics of the nature, history, classification, role, distinction, structure and function, reproduction, improvement, culture, pests, storage and handling, production and marketing, and utilization of agricultural plants.

180. *Assigned Topics.* I, II, S. 1-4 hr. *(Students eligible for this course must be in good standing and have prior division approval of the proposed outline.)* Special studies in agronomy (crops and soils), bacteriology, horticulture, or plant pathology.

195. *Seminar.* II. 1 hr. Discussion of current problems in agriculture and agricultural environmental protection. *(Pass/Fail grading.)*

200. *Recognition and Diagnosis of Plant Disorders.* I. 4 hr. PR: P. Pth. 201 and Ento. 204. Creates an ability for the student to use systematic inspection to determine cause or causes of a plant disorder. *(Course will not be offered in 1986-87.)*

201. *Principles and Methods of Plant Pest Control.* II. 4 hr. PR: P. Pth. 201 and Ento. 204. Concepts of control and how they are implemented by exclusion, eradication, protection, and immunization. *(Course will not be offered in 1986-87.)*

Division of Resource Management

Faculty

Professors

P. Vernon Armbrester, M.S. (WVU)—*Associate Dean, Academic Programs.*
Alfred L. Barr, Ph.D. (Okla. St. U.)—*Associate Director, Agricultural and Forestry Experiment Station.*
Russell C. Butler, Ph.D. (Cornell U.)—*Emeritus.*
James H. Clarke, Ph.D. (U. Minn.)—*Emeritus.*
Clifford W. Collier, Jr., M.L.A. (U. Ga.)—*Extension Landscape Architect.* Architect.
Dale K. Colyer, Ph.D. (U. Wisc.). Production economics, Finance.
Robert G. Diener, Ph.D. (Mich. St. U.). Small farm machinery.
Roy E. Emerson, M.S. (Cornell U.)—*Emeritus.*

Homer C. Evans, Ph.D. (U. Minn.)—*Emeritus.*
Anthony Ferrise, M.S. (WVU). Community development.
Robert L. Jack, Ph.D. (Penn St. U.)—*Interim Chair.* Marketing. Agribusiness.
Warren G. Kelly, Ed.D. (U. Mo.)—*Emeritus.*
Alon Kvashny, Ed.D. (WVU). Site design, Landscape construction.
Layle D. Lawrence, Ph.D. (LSU). Social science research. Curriculum development. Teaching methods.
George Longenecker, M.F.A. (U. Ill.). Plant identification, Planting design.
Alfred D. Longhouse, Ph.D. (WVU)—*Emeritus.*
Beryl B. Maurer, Ph.D. (Penn St. U.)—*Emeritus.*
Robert H. Maxwell, Ph.D. (Cornell U.)—*Dean and Director.* International agricultural development and training.
Kenneth D. McIntosh, Ph.D. (U. Wisc.). Agricultural policy, Land economics.
Ernest J. Nesius, Ph.D. (Iowa St. U.)—*Emeritus.*
Paul E. Nesselroad, Ph.D. (Penn St. U.). Farm management, Agribusiness.
Jackie H. Paules, M.S. (Penn St. U.). Professional practice, Planting design.
Leonard M. Sizer, Ph.D. (St. U. Iowa)—*Emeritus.*
Dennis K. Smith, Ph.D. (Penn St. U.). Rural development.
Ronald L. Stump, M.S. (WVU)—*Emeritus.*
Mary E. Templeton, M.S. (WVU). Marketing, Agribusiness.
George E. Toben, M.S. (U. Ill.)—*Emeritus.*

Associate Professors

Donald R. Armstrong, M.L.A. (Iowa St. U.). Site design, Design implementation.
Thomas L. Bean, Ed.D. (WVU)—*State Safety Extension Specialist.*
Gerald V. Eagan, Ph.D. (U. Tenn.)—*State Extension Specialist.*
Kendall C. Elliott, M.S.Ag.E. (WVU). Farm machinery, Repair.
Kenneth J. Hock, Ph.D. (U. Ariz.). Land economics, Rural development.
Anwarul Hoque, Ph.D. (Mich. St. U.). Production economics, Agricultural development. Applied econometrics.
Alexander G. Karther, M.F.A. (U. Okla.). Design communication, Design methodology.
Marion L. Kimmons, Ph.D. (U. Mo.). Woodwork, Construction.
Steven B. McBride, M.L.A. (U. Mass.). Landscape construction, Site design.
Donald L. Peterson—*Adjunct.* USDA, Appalachian Fruit Research Laboratory.
Delmar R. Yoder, Ph.D. (U. Wisc.). Resource development.

Assistant Professors

Gerald E. D'Souza, Ph.D. (Miss. St. U.). Farm management production economics. Finance.
Stacy A. Gartin, Ph.D. (Ohio St. U.). Communications, Program planning, Leadership development.
Wesley Lynch, M.S. (Mich. St. U.)—*Extension Housing Specialist.*
Charles B. Yuill, M.L.A. (U. Mass.). Computer applications, Site analysis.

Programs

The Division of Resource Management offers degree programs in Agricultural Education, Landscape Architecture, and Resource Management.

The curriculum in Agricultural Education prepares students to teach vocational agriculture. The Landscape Architecture curriculum prepares students for a professional career in that field. Two curriculums in Resource Management provide training in agricultural economics, agribusiness, farm management, rural development, agricultural mechanics, and extension education. These prepare students to pursue graduate studies or work in the fields of agriculture, business, industry, government, finance, extension, and related areas.

The Bachelor of Science program is recommended for students who are planning to pursue graduate studies or to work in more technically oriented

professions. The Bachelor of Science in Agriculture curriculum is for those wishing more general and less scientifically oriented training.

Bachelor of Science in Agriculture

RESOURCE MANAGEMENT CURRICULUM

The Resource Management curriculum provides a student with the opportunity to acquire the necessary background for employment in a variety of fulfilling and stimulating careers. Considerable latitude is provided for students to obtain supportive courses in agriculture and other University offerings in planning the curriculum. Studies in this curriculum include the areas of Agricultural Economics and Agribusiness, Agricultural Mechanics, and Extension Education. Students may select from a number of areas of concentration in the curriculum.

Curriculum Requirements	*Hours*
English Composition and Rhetoric (or conformity with University English requirements)	6
Arts and Humanities (Core A)	12
Social and Behavioral Sciences (Core B)	12
Natural Sciences (Core C)	12
(Must elect a minimum of 4 hours in Biology, 4 hours in Chemistry, and 3 hours in college Algebra or equivalent.)	
Foundation requirements in Agriculture	15
(Elect a minimum of 3-credit course, excluding Assigned Topics, in each of the following: 1. Animal Science; 2. Plant Science; 3. Soil Science; 4. Agricultural Economics; and 5. Agricultural Mechanics.)	
Additional courses in Agriculture	30
(This is a minimum credit in agriculture above agricultural courses identified in the foundation requirements in agriculture. These courses may be elected to prepare for special interest areas.)	
Restricted Electives	15
(To be selected from statistics, computer science, mathematics, business and economics.)	
Electives*	34
	136

*May elect courses in Military Science (ROTC) or Air Force Aerospace Studies (ROTC).

Fields of Study

Agricultural Economics and Agribusiness

There are four areas of concentration which provide specialized training for careers in agricultural economics: General Agricultural Economics, Farm Management, Agribusiness, and Rural Development/Resource Economics. The general agricultural economics area provides a basic background for a variety of agriculturally related careers. The farm management and agribusiness areas provide specialized training for careers in farming, credit, government, or business. The rural development/resource economics area provides training for careers in community development, rural planning, and management of natural resources. Employment opportunities exist with extension, local, state, national, and international agencies.

Students selecting this field of study should take Economics 54 and 55. Students should also develop basic competencies in quantitative methods and

communicative skills, such as: accounting, computer science, statistics, mathematics, and oral and written communications. Each student should complete at least one course in each of these areas as part of University Core or as part of the electives. Students preparing for graduate study should take calculus and intermediate economic theory.

Areas of Concentration and Suggested Courses

General Agricultural Economics: Ag. Ec. 104, 200 (or 211), 231, 240, and 271.

Farm Management: Ag. Ec. 10, 104, 206, 240 (or 231), 261, and 271 (or 200).

Agribusiness: Ag. Ec. 10, 104, 321, 240, 261, and 271 (or 211).

Rural Development/Resource Economics: Ag. Ec. 104 (or 240), 200, 211, 261, and 271.

Agricultural Mechanics

Agricultural Mechanics is a four-year major developed around the Resource Management curriculum. It is designed to give broad training in agricultural sciences and specialization training in agricultural mechanics. It prepares the student for farm management, extension work, farm machinery and equipment sales and service, electric power use, work with federal agencies such as Soil Conservation Service, agricultural loan office with banks, food and non-food processing plants, vocational agricultural teachers in multi-teacher departments, and other related fields to agriculture.

Suggested Courses:

Agr. M. 120—Shop Theory and Methods
Agr. M. 230—Farm Structures
Agr. M. 240—Agricultural Engines
Agr. M. 260—Advanced Farm Machinery
Agr. M. 270—Electricity in Agriculture
C.E. 5—Land Surveying

Extension Education

Persons who work in the Cooperative Extension Service are involved in out-of-school education for youth and adults. Extension educators conduct agricultural education programs and community development projects designed to enhance rural living.

Students interested in employment as a county agent may acquire needed competencies by pursuing course work in rural sociology, educational psychology, adult education, community development, business, economics, speech communication, technology education, public relations, and news writing.

Students who are interested in employment as a 4-H Club Agent should pursue course work in the same areas as prescribed for county agents with the exception of a basic course in business and economics. Additional competencies needed to work efficiently with youth groups may be acquired by taking courses in adolescent psychology and leadership development.

Suggested Courses:

Ag. Ed. 260—Principles of Cooperative Extension
Ag. Ed. 261—Methods and Materials in Extension Education
Ag. Ed. 362—Program Building in Cooperative Extension

Bachelor of Science in Agriculture

AGRICULTURAL EDUCATION CURRICULUM

The main purpose of agricultural education is to educate those who would be teachers in vocational agriculture.

An effective vocational agriculture teacher can assist in the economic and social development of a community. One can accomplish this by teaching a total program of vocational agriculture, in and through the high school. Day, young farmer, adult farmer, and off-farm agricultural occupations classes and groups, taught through supervised occupational experience programs, are the tools with which the vocational teacher helps build a more desirable community.

Curriculum Requirements	*Hours*
English Composition and Rhetoric (or conformity with University English requirements)	6
Arts and Humanities (Core A)	12
Social and Behavioral Sciences (Core B)	12
Natural Sciences (Core C included)	24
(Must elect a minimum of 8 hours in Biology; 8 hours in Chemistry; 3 hours in college Algebra or equivalent.)	
Courses in Agriculture	45
Elect a minimum of a 3-credit course, excluding Assigned Topics in each of the following: 1. Animal Science; 2. Plant Science; 3. Soil Science; and 4. Agricultural Economics. Elect additional courses to obtain the total of 45 hours in Agriculture.	
General Physical Education	2
Electives*	35
Total	136

*May elect courses in Military Science (ROTC) or Air Force Aerospace Studies (ROTC).

Students completing this program will meet requirements for certification by the West Virginia Department of Education. The program provides graduates with the opportunity to become qualified to teach in the broad field of vocational agriculture as well as to become especially prepared to teach in agricultural production and management, animal processing, agricultural mechanics, agricultural sales and services, conservation, horticulture produce industry, or ornamental horticulture. Courses are also offered in extension education for any University student planning for a career in cooperative extension.

A student selecting the comprehensive field for vocational agriculture teaching shall complete the above listed curriculum requirements. It is also suggested that each student choose one of the seven options listed below to guide the student's program of study.

Students in this curriculum are advised to refer to the section of the *WVU Undergraduate Catalog* entitled: "Programs for Secondary School Teachers" in the Department of Curriculum and Instruction, College of Human Resources and Education:

	Hours
A. Agricultural Production and Management	17
B. Animal Processing	17
C. Agricultural Mechanics	17
D. Agricultural Sales and Service	17

E. Conservation 17
F. Horticulture Produce Industry 17
G. Ornamental Hortculture 17

Bachelor of Science

RESOURCE MANAGEMENT CURRICULUM

The curriculum of bachelor of science, with its flexible design, will provide the student with the opportunity to acquire the necessary background in mathematics, statistics, computer science, and economic theory and modern concepts of science in preparation for professional or graduate study. Selection of individual courses is the responsibility of the student in consultation with the adviser.

Curriculum Requirements	*Hours*
English Composition and Rhetoric (or conformity with University English requirements)	6
Arts and Humanities (Core A)	12
Social and Behavioral Sciences (Core B)	20
(The student shall elect a minimum of one course in each: History, Political Science, Psychology, and Sociology and Anthropology.)	
Natural Sciences (Core C)	26
(The student shall elect two courses in Calculus and two in Statistics.)	
Computer Science	6
Courses in College of Agriculture and Forestry	24
Electives*	34
Total	128

*May elect courses in Military Science (ROTC) or Air Force Aerospace Studies (ROTC).

Bachelor of Science in Landscape Architecture

LANDSCAPE ARCHITECTURE CURRICULUM

The major thrust of the Landscape Architecture Program at WVU is to prepare its graduates for entry-level professional competency in landscape architecture. The program is based upon a solid design, planning and construction core, which is expanded to address the unique regional needs of Appalachia and its peripheral areas.

The faculty compose a true multidisciplinary team, with practical experiences in creative and scientific research, design, consultation, and public service. This diversity is the nucleus of the program, allowing for a strong undergraduate curriculum supplemented by related courses in the arts, sciences, engineering, and planning, reflecting the needs of our region and the national market place.

Graduates of the program can assume traditional landscape architectural roles, e.g., positions with design consulting firms, governmental planning departments, construction firms, transportation planning agencies, etc. In addition, WVU graduates are prepared for design and planning positions meeting the needs common to West Virginia and other rural areas.

The Landscape Architecture Program is fully accredited by the Landscape Architecture Accreditation Board of the American Society of Landscape Architects.

Curriculum Requirements	*Hours*
English Composition and Rhetoric (or conformity with University English requirements)	6
Arts and Humanities (Core A)	12
(A minimum of 6 credits in Studio Art.)	
Social and Behavioral Sciences (Core B)	12
Natural Sciences (Core C)	12
(To include Inorganic Chemistry, Biol. 1 or equiv., and Math. 3 and 4 or 14; Calculus may be substituted for the mathematics requirement.)	
Selected Electives in Agriculture and Forestry	15
Elect courses in at least three areas listed: 1. Agricultural Economics/Resource Management; 2. Agricultural Mechanics; 3. Agronomy/Plant Sciences; 4. Forestry/Recreation and Parks; and 5. Horticulture. (Credits earned in Assigned Topics courses such as Res. M. 180 are not considered acceptable in meeting this requirement.)	
Courses in Landscape Architecture*	60
Electives	19
Total	136

*In addition each student will be required to work for at least one summer in an approved landscape architecture office, or equivalent.

To be eligible to advance in proper sequence in Landscape Architecture, a student must attain a C grade or better for each of the following courses: L. Arc. 20, 21, 50, 51, 131, 132, 140, 141, 150, 151, 250, and 251.

Of the 60 hours required for a Bachelor of Science in Landscape Architecture, the following courses, or their equivalent, are required: L. Arc. 20, 21, 40, 41, 50, 51, 112, 131, 132, 140, 141, 150, 151, 250, 251, and 284.

Courses of Instruction

Agricultural Economics (Ag. Ec.)

(Economics 51 or 54 is required as a prerequisite for all courses in Agricultural Economics numbered 100 or above.)

10. *Agribusiness Accounting.* I. 4 hr. Accounting for business managers who do not intend to become accountants. (Students having prior college credit in accounting are not eligible for this course.) A brief coverage of terminology and methodology; decisions in accounting as directed by executives; interpretations and values from accounts and accounting statements.

104. *Farm Management.* I or II. 3 hr. The decision-making process; procedures for profit maximation; principles in assembling, analyzing, and using farm business records; the use of budgeting in evaluating alternatives.

195. *Senior Seminar, Agricultural Economics.* I. 1 hr. PR: Senior standing, major in resource management. A seminar to explore selected issues in agricultural economics for seniors majoring in resource management. The seminar is oriented to the consideration of current economic issues, potential employment responsibilities, and advanced study opportunities.

200. *Land Economics.* II. 3 hr. Classification, development, tenure, use, conservation, valuation, and taxation of rural, urban, mineral, forest, water, and recreational land resources. Private and public rights in land and the effect of population on the demand for land.

206. *Farm Planning.* I. 3 hr. PR: Ag. Ec. 104 or consent. Planning use of labor, soil, crops, livestock, buildings, and equipment; principal factors influencing returns on farms. *(Farm visits required.)*

211. *Rural Economic Development.* I or II. 3 hr. Resource utilization, economic behavior and economic systems and subsystems, trade, public revenue and its allocation, distribution of income, manpower problems, development policies, and regionalization in rural areas.

231. *Marketing Agricultural Products.* I or II. 3 hr. Market organization, policies, practices, and factors affecting the marketing of agricultural products. *(Tour of market agencies and facilities required.)*

235. *Marketing Dairy Products.* II. 2 hr. Milk-marketing policies and practices, including milk-market orders. *(Offered in Spring of odd years.)*

240. *Agricultural Prices.* I. 3 hr. Analysis of price-making forces which operate in the market places for the major agricultural commodities.

261. *Agribusiness Finance.* II. 3 hr. Credit needs for agricultural businesses, financing farm and market-agency firms, and organization and operation of credit agencies which finance agricultural business firms.

271. *Agricultural Policy.* II. 3 hr. Examination of economic aspects of governmental price programs, production and marketing controls, subsidies, parity, export and import policies, and other programs affecting agriculture.

330. *Cooperative Organization.* II. 3 hr. Organization, functions, and contributions of cooperatives in an economic system.

342. *International Agricultural Economic Development.* I. 3 hr. Current problems, theories, policies and strategies in planning for agricultural and rural development for increased food production and to improve the well-being of rural people in the developing countries of the world.

343. *Agricultural Project Analysis and Evaluation.* II. 3 hr. PR: Consent. Design, analysis and evaluation of development projects; economic and financial aspects of project analysis; identification and measures of comparing projects costs and benefits; preparation of feasibility reports. 3 hr. lec.

355. *Resource Analysis.* I. 3 hr. PR: Senior standing. Construction of models consistent with economic reality for allocating the factors of production available on farms, in forests, and in non-farm agricultural businesses to produce maximizing plans through use of linear and dynamic programming and electronic equipment.

Agricultural Education (Ag. Ed.)

160. *Materials for and Method of High School Teaching of Vocational Agriculture.* I. 3 hr. PR: Consent. Organization and preparation for teaching vocational agriculture in and through the high school. *(Also listed as C&I 160.)*

162. *Group Organization and Leadership.* I. 2 hr. PR: Consent. Principles and techniques involved in forming, structuring, developing, and directing organizations for effective professional leadership.

188. *Student Teaching.* I, II. 8 hr. PR: C&I 7, Ed. P. 105 and 106. *(See C&I 188 requirements.)*

260. *Principles of Cooperative Extension.* I. 2 hr. PR: Consent. Background, philosophy, and history of cooperative extension. Activities of county cooperative extension agents and cooperative extension programs in West Virginia.

261. *Methods and Materials in Extension Education.* II. 2 hr. PR: Consent. Organization and preparation for extension teaching and the processes of communication.

263. *Teaching Young, Adult Farmer, and Off-Farm Agricultural Occupations Classes.* I. 2 hr. PR: Ed. P. 105, 106 or consent. Participation in conducting young farmer, adult farmer, and off-farm agricultural occupations classes; organization, course of study, method in teaching, and supervision of classes, young farmers' associations, adult farmers' organizations, and off-farm agricultural occupations organizations. *(Also listed as C&I 263.)*

264. *Cooperative Vocational Education.* II. 4 hr. PR: Consent. Preparation for planning, organizing, and conducting high school programs of cooperative vocational education, and familiarization with business organization and operation. *(Also listed as C&I 264.)*

362. *Program Building in Cooperative Extension.* II. 3 hr. PR: Consent. Organization in relation to program building. Leadership and group action. Overall working and educational objectives, principles, method, and goals in developing county extension programs. *(Offered in Spring of even years.)*

364. *Organizing and Directing Supervised Farming and Supervised Occupational Experience Programs.* S. 2 hr. PR: Ag. Ed. 160 or consent. Planning programs of supervised farming and supervised occupational experience, supervising, and evaluating such programs for day students, young farmers, adult farmer, and off-farm occupations classes and groups. *(Also listed as C&I 364.)*

Agricultural Mechanics (Ag. M.)

10. *Principles of Agricultural Mechanics.* I. 3 hr. A study of the development of mechanized production and processing together with the impact of such mechanization on environment, utilization of natural and renewable resources, pollution, and their effect on ecology. 3 hr. rec.

120. *Shop Theory and Methods.* I, II. 4 hr. Six areas of basic shop work: carpentry, cold metal work, hot metal work (forge, electric and gas welding), sheet metal (soldering, forming, cutting, riveting), tool care, and plumbing. 1 hr. rec., 6 hr. lab.

230. *Farm Structures.* II. 3 hr. Study of structures required for agriculture, family housing, storage, and recreation. Includes function, planning, layout, materials, construction techniques, prefabrication, repair, remodeling, and costs. 2 hr. rec., 3 hr. lab.

240. *Agricultural Engines.* I, II. 3 hr. Study of power sources (gasoline, diesel, turbine, wankel, etc.) for agriculture and forestry. Operation, selection, maintenance techniques, and emissions impact on power and fuel efficiency. 2 hr. rec., 3 hr. lab.

260. *Advanced Farm Machinery.* I. 3 hr. Systems approach to selection, use, and operation of machinery as related to agriculture, forestry, and other rural activities. Emphasis on safety and environmental impact. Use of records for management decisions, purchase, replacement, sale, or overhaul. 2 hr. rec., 3 hr. lab.

270. *Electricity in Agriculture.* II. 3 hr. Study of production and safe use of electricity for home and agriculture. Emphasis on approved wiring practices, motors, and electrical controls and their applications in lighting, heating, refrigeration, air conditioning, water supply, and processing. 2 hr. rec., 3 hr. lab.

321. *Advanced Farm Mechanics.* S. 3 hr. PR: Agr. M. 120. Development of advanced skills with hand and power tools. Areas of emphasis dependent upon needs of individual students. Care and maintenance of power tools and shop organization and planning are essential parts of this course. 1 hr. rec., 6 hr. lab. *(Offered Summer of every third year—next offering 1987.)*

Landscape Architecture (L. Arc.)

5. *Introduction to Landscape Architecture.* I, II. 1 hr. A general overview of the field of landscape architecture, environmental design and planning.

20. *Landscape Architectural Drawing.* I. 3 hr. PR: For Landscape Architecture majors only. Introduction to elements of visual techniques in drafting, basic design, and environmental systems. 2-3 hr. studio.

21. *Landscape Architectural Graphics.* II. 3 hr. Introduction to design and graphic methodology with applications to current standards. Development of principles of communication in two- and three-dimensional visual thinking applicable to environmental design professions. 2 3-hr. studio.

31. *Landscape Construction Materials and Methods.* I. 3 hr. PR: L. Arc. 20. A study of materials used in landscape architectural construction with emphasis on methods of construction and the preparation of construction drawings for design implementation. 2 hr. lec., 1 2-hr. lab.

40. *Plants and Design 1.* I. 3 hr. PR: Biol. 1 or equiv. Study of commonly used woody ornamental plants, their identification, cultural needs, and use in design. The study of plants outdoors whenever possible, a one-day nursery trip, and simple planting design projects. 2 3-hr. lab..

41. *Planting Design 1.* II. 3 hr. PR: L. Arc. 21, 40. Study of planting technqiues, preparation of planting and seeding specifications, and an introduction to the preparation of planting plans. 2 hr. lec., 1 2-hr. studio.

50. *Theory of Landscape Architectural Design.* I. 3 hr. PR: L. Arc. 21 or equiv. Application of elements and principles of art and design to landscape architecture. 1 hr. lec., 2 2-hr. studio.

51. *Landscape Architectural Design.* II. 3 hr. PR: L. Arc. 50 or equiv. Investigation and application of various design factors which play a role in design and natural and man-made environment. 1 hr. lec., 2 2-hr. studio.

112. *History of Landscape Architecture.* II. 3 hr. PR: Consent. A broad survey of the history of the designed environment with emphasis on the development of landscape architecture.

131. *Landscape Architectural Construction 1.* I. 4 hr. PR: C.E. 1 or 5 equiv., Math. 3 and 4 or 14 or equiv. The study of the technical principles of grading design, their application to site planning, and preparation of land form grading plans. 1 hr. lec., 2 3-hr. lab.

132. *Landscape Architectural Construction 2.* II. 4 hr. PR: L. Arc. 131. Study and preparation of parkway plans (road alignment), surface and sub-surface drainage plans, advanced grading plans, and cost estimates. 2 hr. lec., 2 2-hr. lab.

140. *Plants and Design 2.* I. 3 hr. PR: L. Arc. 41, 51; Conc.: L. Arc. 150. Study of native and naturalized plants of this region, their ecological tolerances, their importance to site analysis, and their use in biomorphic design. 2 3-hr. studio.

141. *Planting Design 2.* II. 3 hr. PR: L. Arc. 140. The study of plants and planting design considerations for a variety of specific conditions. 2 3-hr. studio.

150. *Landscape Architectural Design 2.* I. 5 hr. PR: L. Arc. 41 and 51. Study of medium scale site design with emphasis on site analysis, design methodology and presentation. 1 hr. lec., 2 3-hr. studio.

151. *Landscape Architectural Design 3.* II. 5 hr. PR: L. Arc. 131, 140, 150. Site-design problems dealing with complex environmental systems emphasizing rural and urban design. Projects are integrated with landscape architectural construction.

229. *Landscape Architecture.* I. 3 hr. PR: For non-Landscape Architecture majors only. An appreciation of the basic principles of planting design and information pertaining to the use of ornamental plants around the home. 2 hr. lec., 1 2-hr. lab.

248. *Design Analysis.* II. 2 hr. PR: Consent. Analysis of planning and design projects to offer solutions to a given problem. *(Offered in Spring of odd years.)*

250. *Advanced Landscape Architectural Design 1.* I. 6 hr. PR: L. Arc. 132, 141, and 151. Comprehensive design problems integrating all aspects of site design, planting design and construction. Includes advanced projects for urban and rural sites. 2 1-hr. lec., 2 4-hr. studio.

251. *Advanced Landscape Architectural Design 2.* II. 6 hr. PR: L. Arc. 250. Advanced comprehensive design problems. Continuation of L. Arc. 250, culminating in a comprehensive final design project. 3 hr. lec., 2 3-hr. studio.

265. *Regional Design.* II. 3 hr. PR: Consent. Consideration of regional landscapes in order to effectively relate design to the ecology and development of a region. *(Offered in Spring of even years.)*

284. *Professional Practice.* I. 3 hr. PR: Consent. Procedures in preparation of contract documents, fees, estimates, operation of an office, and relationship to clients and contractors.

Resource Management (Res. M.)

1. *American Food and Agricultural Industry.* I. 3 hr. PR: Freshman standing or consent. Examination of the structure, function, and importance of the food and agricultural industry in the United States.

180. *Assigned Topics.* I, II. S. 1-4 hr. PR: In order to be eligible to register in Assigned Topics (Res. M. 180), the student must: (1) be in good standing, and (2) obtain approval of the Division of Resource Management before registration.

College of Arts and Sciences

Thomas J. Knight, Ph.D. (U. Tex.), *Dean of the College; Professor of History.*
Charles W. Connell, Ph.D. (Rutgers U.), *Associate Dean; Associate Professor of History.*
Gerald E. Lang, Ph.D. (Rutgers U.), *Assistant Dean; Professor of Biology.*
John F. Schnabel, Ph.D. (U. Notre Dame), *Assistant Dean; Director, Academic Advising; Associate Professor of Sociology.*

The primary mission of the College of Arts and Sciences is to promote the full development of the student as an individual and as a member of society. Students earning degrees in Arts and Sciences fulfill certain broad basic-education requirements and study at least one subject in some depth. The degree requirements are intended to carry forward what is usually termed "a general education," thus providing a foundation for continued growth and development after graduation.

Through courses offered within the College students should develop totally—intellectually, spiritually, physically, and emotionally. They are given a solid base on which to build, both preparing for a career and growing for life.

Clearly, one purpose of a college education is to help students acquire knowledge and skills both for self-fulfillment and in preparation for the roles they will subsequently play in society. A less obvious but equally important purpose is to impart certain attitudes to students. In the interest of fulfilling

both purposes, the College of Arts and Sciences strives to help students acquire the specific attributes listed below.

Knowledge

1. A knowledge of the main principles, facts, concepts, and theories in a major area of concentration.
2. A knowledge of Western and non-Western civilizations: their distinctive characters (belief systems, languages, intellectual and artistic contributions), and their origins, development, and present states.
3. A knowledge and appreciation of the environment in which one operates (physical, biotic, social, technological, aesthetic), including knowledge of change processes (evolutionary, technological, social, intellectual) and knowledge of past adaptations as a basis for predicting the consequences of contemporary actions and changes.
4. A knowledge and appreciation of the arts, of their humanizing and energizing effects, and of one's connection with the arts through one's impulses toward creativity.
5. A familiarity with the various technical languages (statistics, linguistics, etc.) that are increasingly necessary to understand the major approaches in the sciences and humanities.

Skills

1. Skills in the sophisticated techniques of a major area of concentration.
2. Skills in communication using a variety of channels including writing, speaking, reading, listening, and viewing.
3. Skills in analyzing and solving problems by recognizing ambiguities, using proper logic, marshalling pertinent facts and arguments, and using mathematicial techniques where appropriate.
4. Skills in the use of the imaginative and synthetic process of mind, including innovative thinking and recognition of the connections among a variety of intellectual frameworks and matrices.
5. Skills involved in decision-making, including the ability to recognize alternatives, project consequences, and assume the responsibility for making decisions.

Attitudes

1. An attitude of dispassionate self-appraisal, based upon an understanding of one's own nature and characterized by an awareness of one's own strengths and weaknesses.
2. An attitude of open-mindedness, permitting one to see beyond the limits of one's own occupation, economic status, language, and culture, and including a respect for opinions different from one's own.
3. A willingness to recognize and respect ethical obligations and the rights of others.
4. A commitment to truth-seeking, characterized by objectivity, utilization of evidence, intellectual curiosity, and the search for wisdom.

Enrollment

Three types of students enroll in the College of Arts and Sciences: students working toward a degree in the College of Arts and Sciences; those pursuing a preprofessional curriculum in anticipation of earning a bachelor's degree in a professional school; and special students who are not degree candidates.

Minimum and Maximum Load. A minimum of 12 hours in a semester is required for full-time status in the College of Arts and Sciences. No student enrolled in the College of Arts and Sciences may enroll for more than 19 hours in a semester without permission from the Committee on Academic Standards.

Admission to Arts and Sciences Degree Programs

Minimal College of Arts and Sciences requirements for regular admission into many degree programs are completion of 58 hours of course credit, a 2.0 overall average, and a 2.0 average in courses already completed in the discipline of the degree program to which the student is applying. Specific degree programs may have additional requirements.

Students may be admitted to degree programs in the College of Arts and Sciences in two distinct categories:

1. *Regular Admission.* Student has met all degree program requirements.
2. *Provisional Admission.* Student has completed 58 hours but has not yet met all College of Arts and Sciences and/or degree program requirements for entrance into the specific program. It should be stated in writing by the department offering the degree program. The provisional terms under which the student is accepted should be stated in writing by the department. The deficiencies and date should be clearly stated. Failure on the part of the student to remove deficiencies by the stipulated date will result in suspension from the degree program.

If a student has not been admitted to a degree program by the time of completion of 70 hours of course work, he/she will not be permitted to re-enroll in the College of Arts and Sciences.

Students planning to qualify for teacher certification as well as for an Arts and Sciences degree should check with their advisers and the *Catalog* statement (College of Human Resources and Education) to determine the requirements for such certification.

Additional information concerning admissions, fees and expenses is in Part 2 of the *Undergraduate Catalog.* Academic information is in Part 3.

Degree Programs in Arts and Sciences

The following degree programs are offered:

Biology
Chemistry
Computer Science
Economics
English
Foreign Languages
Geography
Geology
History
Interdepartmental Major
Mathematics
Philosophy
Physics
Political Science
Psychology
Regents B.A.
Sociology and Anthropology
Speech Communication
Statistics

Although some degree programs, (e.g., optometry and architecture) are not offered by WVU, students may initiate degree programs under the auspices of the Academic Common Market (see page 51). Normally, students would enroll for their first year or more at WVU, establish an academic record, and then submit an application for transfer to the out-of-state

institution. Additional information is available at the Academic Advising Center.

Board of Regents Bachelor of Arts Degree

Especially designed for the adult, the Board of Regents Bachelor of Arts Degree offers students the opportunity to gain credits for work and life experience (college equivalent credit).

Degree Requirements—Total credits: 128. Upper-Division credits: 40. General Education: 36, including, Communications, 6; Humanities, 6; Natural Sciences, 6; Social Sciences, 6.

Admission—Admission requirements are the same as for other WVU degree programs except students are not eligible for admission until four years after graduation from high school.

In addition, full-time students enrolled in other baccalaureate degree programs at the University may not be admitted to the Regents Program. Adults who have not been engaged in full-time study for at least one calendar year may be eligible for admission with the approval of the Coordinator.

Also ineligible to enroll in the program are those students whose grade-point averages make them subject to academic suspension from the University.

Fees—Tuition and fees are the same for the Regents B.A. Program as for other WVU degree programs except for the evaluation fee for life and work experiential learning assessment.

Detailed information is available from: Coordinator, Board of Regents B.A. Degree Program, WVU Student Services Center, Morgantown, WV 26506. Telephone (304) 293-7476.

Interdepartmental Majors

Interdepartmental major programs involve concentrated study in more than one department in the College of Arts and Sciences of the University. These programs, which lead to the Bachelor of Arts degree, are of three kinds: Individualized Major Program; Specially Designated Area Programs; and Liberal Arts Major.

Individualized Major Program

The individualized major provides the undergraduate student an opportunity to arrange an individually tailored program when the educational aims of the student fall between established department boundaries. Ideally, the proposal should be developed during the sophomore year since a student normally would be expected to embark on this program at the beginning of the junior year. A major typically involves only two academic departments—one of which must be in the College of Arts and Sciences—and the program should be planned so that the student attains academic depth at least matching the depth and rigor of a traditional departmental major.

Students considering the Individualized Major Program are encouraged to approach the chairperson of the Individualized Major Committee of the College of Arts and Sciences with program ideas or questions before submitting a formal proposal. Following the initial discussion, students are advised to seek counsel with individual faculty who may thereafter agree to become part of a faculty advisory committee. When initial discussion and consultation are completed, students are encouraged to submit the formal

proposal for acceptance into the program. The proposal is submitted first to the student's advisory committee, then to the Individualized Major Committee, and should include: (1) a definition of the area of concentration; (2) a statement of the objectives served by the program; (3) a listing of courses that will constitute the program; and (4) a brief personal intellectual biography. Additional information about the formal proposal is available at the Academic Advising Office of the College, 206 Student Services Center.

Specially Designated Area Programs

Appalachian Studies

Degree Conferred: B.A.
Contact: Avery Gaskins, *Coordinator*, 293-3107
426 Stansbury Hall

Nature of Program

The interdepartmental major in Appalachian Studies is designed to allow students to understand the growing body of knowledge about the problems and culture of the Appalachian region. WVU is uniquely equipped to provide a program of outstanding quality since the WVU Library has been collecting Appalachian materials for many years and nationally recognized experts on various aspects of Appalachian culture are in permanent residence on campus.

Admission

The general procedure for admission to the program is as follows: (1) the student will contact the chairperson of the Appalachian Studies Advisory Committee for information and guidance in making an application and in drawing up a program of study; (2) the chairperson or other designated member of the Advisory Committee will be the student's major adviser and will sign the student's schedule forms each semester; (3) upon completion of the program and all other College and University requirements, the student will be awarded the degree of Bachelor of Arts from the College of Arts and Sciences.

Art History

Degree Conferred: B.A.
Contact: Margaret T. Rajam, *Coordinator*, 293-3140
419-A Creative Arts Center

Nature of Program

The interdepartmental major in the Art History is designed to give an interdisciplinary approach to the study of objects of art, how they are made, the ways in which they are used, and the civilizations and modes of thought which produce them—a range from the concrete to the metaphysical. This program provides a systematic foundation in the history of the art of the Western world. Requirements in art history and studio art are offered in the College of Creative Arts, and those in history, anthropology, and language in the College of Arts and Sciences. Students are encouraged to add a broad background, according to interest, from selected courses in several areas including art, business and economics, English, foreign languages, history, humanities, journalism, library science, music, philosophy, public administration, religious studies, sociology and anthropology, and theatre. A senior

research project, on an approved subject selected by the student, is completed during the last semester.

Comparative Literature

Degree Conferred: B.A.
Contact: Elizabeth Madison, *Coordinator*, 293-3107
223 Stansbury Hall

Nature of Program

The Comparative Literature major is an examination of literature in its many aspects without national and linguistic boundaries. The program is designed for those students who wish to explore the languages and literatures of at least two cultures and provides for those students a liberal education based on a comparative study of literary masterpieces and their relationship to history, philosophy, and the fine arts. The curriculum seeks to develop a student's ability to read critically, to aid the student in gaining a more integrated sense of general literary history, and to prepare the student to investigate problems involving more than one literature (for example, the study of themes and myths, genres and forms, movements and eras, literature and the other arts, literary theory and criticism).

The undergraduate degree is intended to provide a basis for the following areas of professional specialization: graduate study in comparative literature, English, or foreign language; teaching of literature or foreign language; government work, international relations, or business administration, particularly in those areas of government or business which require an extensive knowledge of foreign culture and the ability to communicate well in both English and a foreign language.

Admission Requirements

Contact Elizabeth Madison.

Degree Requirements

A student must fulfill all University and College of Arts and Sciences degree requirements. A sample course of study for the undergraduate major in comparative literature follows:

Courses in the English Department—Required: English 125, 232; 1 language course (111, 113, 210, 211); 12 hours from among English 35/36, 21/22. 24/25. *Recommended:* Upper-division work in American, British, or world literature. Total hours required: 22.

Courses in the Foreign Languages Department—Required: 6 hours of advanced literature in the first foreign language; 12 hours from the following categories: second foreign language; additional language or literature courses in the first foreign language; literature in translation courses. Total hours required: 18.

The student is also required to take a one-hour seminar in methodology (directed study).

Dance and Liberal Studies

Degree Conferred: B.A.
Contact: Charles W. Connell, *Coordinator*, 293-4611
201 Woodburn Hall

Nature of Program

This interdepartmental major is offered cooperately with the dance program of the School of Physical Education. It is designed for the student with an interest in dance who wishes to pursue a broad liberal arts education with a concentration in a specific area within the College of Arts and Sciences. Students must fulfill all requirements of the University and of the College of Arts and Sciences.

Degree Requirements

Dance courses required for this major include 12 hours of technique classes (ballet, modern, and jazz); four courses in dance theory and related subjects; 12 hours of dance electives chosen from such classes as choreography, dance production, theatre dance, movement and rhythms, sports injury, and kinesiology. In addition, the student will earn 9 hours through participation in one of the University's performing dance companies before graduation over a number of semesters. A total of 42 hours in dance is required.

The Arts and Sciences concentration may be selected from any department in the College. A total of 30 hours in the area of specialization is specified.

International Studies

Degree Conferred: B.A.
Contact:
Sophia Peterson, *Coordinator*, 293-7140
Rodger D. Yeager, *Adviser*, 293-3811
316 Woodburn Hall

Nature of Program

The International Studies major is designed to provide a knowledge of global affairs, to help develop understanding and appreciation of other cultures and societies, and to promote informed analysis of world interdependence. It provides the basis for careers in many areas, e.g., international business and commerce, international administration and service, as well as government, law, and research.

Degree Requirements

The major consists of four parts:

1. Orientation to International Studies (1 hour).

2. Introductory Core (15 hours)—Majors are required to take Economics 54 and 55 and three more courses from the following: FLIT 13-18; Geography 1, 7, 8; History 2, 4, 5, 6; Humanities 5; Multidisciplinary Studies 90; Political Science 3; Sociology and Anthropology 5, 51.

3. Advanced Core (12 hours)—Majors are required to take four courses from the following: Economics 110, 250; Geography 202; Political Science 150, 160.

4. Area of Concentration (24 hours)—Students select an Area of Concentration for specialization (Africa and the Middle East, East Asia, East Europe, West Europe, Latin America, or a topic such as Development Studies.) Students take a variety of courses in economics, foreign languages, geography, history, music, philosophy, political science, religious studies, sociology and anthropology, and technology education.

Other Options

With prior approval by the International Studies Adviser, students may receive academic credit toward the degree for internships in Washington, D.C. and elsewhere and/or for study abroad.

Additional information, see pages 172-173.

Medieval and Renaissance Studies

Degree Conferred: B.A.
Contact: Elizabeth K. Hudson, *Coordinator*, 293-2421
221 Woodburn Hall

Nature of Program

This interdepartmental major is designed to provide a broad liberal arts background while permitting the student to achieve a fuller understanding of the culture of this period in which were developed many of the enduring social, political, religious, artistic, and literary traditions of Western civilization.

Degree Requirements

By selecting a primary area of concentration of 15 upper-division hours and two secondary areas of 9 upper-division hours each from the fields of English, foreign languages, history, or the arts, the student is required to examine medieval and Renaissance culture from a variety of perspectives. Six hours of Latin must also be completed for this major. With careful selection of courses, this program may be combined with a traditional departmental major.

Music

Degree Conferred: B.A.
Contact: Cecil B. Wilson, *Coordinator*, 293-4091
314 Creative Arts Center

Nature of Program

The interdepartmental program in Music, which is offered cooperatively with the College of Creative Arts, is intended for the student with an interest in music who wishes to pursue a broad liberal arts education, rather than seek a professional career as a performer, composer, or teacher. (Students interested in professional careers in music should enter a Bachelor of Music program, described elsewhere in this *Catalog*.) Depending upon individual interests, students may choose elective courses which could also provide a basis for careers in music librarianship, computer science, music merchandising, arts management, or music criticism.

Admission Requirements

Students wishing to enter this program must have the approval of the program adviser, and must meet audition requirements in a principal performance area, which can be piano, organ, voice or band or orchestra instrument.

Additional details may be found on pages 274-275 of this *Catalog*.

Religious Studies

Degree Conferred: B.A.
Contact: Manfred O. Meitzen, *Coordinator*, 293-4995
322 Stansbury Hall

Nature of Program

The interdepartmental degree program in Religious Studies offers a basic general liberal arts education for students entering such professions as law, medicine, and business, if electives are carefully chosen. This major is useful to anyone seeking a professional career in religion, such as the ministry, academic study of theology or biblical studies, religious journalism, or teaching in the area of religion.

The student should be aware of the large amount of discretion offered by this degree program in the area of elective work. It is quite possible to arrange a double major in another subject while undertaking the interdepartmental major in Religious Studies.

Slavic Studies

Degree Conferred: B.A.
Contact: Marilyn Bendena, *Coordinator*, 293-5121
317-A Chitwood Hall

Faculty

Marilyn Bendena, Ph.D. (Wayne St. U.), *Associate Professor of Foreign Languages.*
Robert E. Blobaum, Jr., Ph.D. (U. Nebr.), *Assistant Professor of History.*
Yiri T. Kolaja, Ph.D. (Cornell U.), *Professor of Sociology.*
George W. Rice, Ph.D. (Ohio St. U.), *Professor of Political Science.*
Henry Ruf, Ph.D. (Emory U.), *Professor of Philosophy.*

Nature of Program

The objective of the Slavic Studies interdepartmental major is to provide a well-rounded understanding of the Soviet Union and Eastern Europe. The guidelines have sufficient depth to provide for further study on the graduate level in one of the Slavic areas and sufficient breadth to provide a meaningful liberal arts major. Included in the Slavic Studies major are courses in the departments of foreign languages, history, philosophy, political science, and sociology and anthropology.

The demand of government and private industry for specialists in Russian and East European area studies has been expanding in recent years. This program seeks to prepare students for this job market. Certification to teach on the secondary level is also possible, if the student simultaneously elects the required courses in the College of Human Resources and Education.

Although the major is interdepartmental, faculty members work closely together and with individual students to provide academic counseling and job referral. The coordinator of the program functions as principal adviser to majors. The program also offers extracurricular activities which help to develop an appreciation for the Slavic world.

Admission Requirements

The student must fulfill all University and College of Arts and Sciences degree requirements. The student must have the equivalent of 2 years of Russian.

Degree Requirements

The major requires a minimum of 30 hours, 15 of which must include:

1. History 117 and 118.
2. Russian 103 and 104 *or* Russian 109 and 110.
3. Political Science 251 *or* 266.

The remaining hours required may be chosen from a flexible list of courses approved by the Slavic Studies Committee. Currently such courses could include: History 111/481, 217, 218, Philosophy 113, Russian 144, 145, 292, and Sociology and Anthropology 145.

Liberal Arts Major

Degree Conferred: B.A.
Contact: John F. Schnabel, Coordinator, 293-7476
218 Student Services Center

Nature of Program

The program of study leading to a degree of Bachelor of Arts with an interdepartmental major in Liberal Arts is a four-year curriculum offering the student an opportunity to develop a critical understanding of the major fields of human knowledge and their interrelationships. Its primary concern is with that part of a student's whole education which looks first of all to his/her life as a responsible human being and citizen. At the same time, the program does not ignore that part of higher education which looks to the development of competence in some special area of interest. Thus, the program is designed for the student to achieve two objectives: (1) to become a "liberally" educated person; and (2) to gain a specialized knowledge in an area or subject of particular interest.

Admission Requirements

Any student is eligible to apply for admission to the interdepartmental major program. Ideally, the student should seek admission to the program during the sophomore year; however, any student may consider adoption of the program at any point in the academic career provided the requirements of the program, the College of Arts and Sciences, and the University, can still be met. Additional information is available through the Academic Advising Office, 206 Student Services Center.

Degree Requirements

With few exceptions, the basic College and University requirements and regulations apply to the liberal arts interdepartmental major. The particular requirements of the major call for a balanced distribution of 80 to 90 credit hours among courses in the humanities, the social sciences, and mathematics and science. Selection of specific courses is worked out in conference between the student and the faculty adviser.

Although the program does not require the student to identify a single academic discipline as a major, there is sufficient flexibility in the curriculum to permit a student with strong academic interests and career goals to concentrate study in one area of interest to an extent that comes close to equaling a major in a single academic discipline. Students considering enrollment in this program should discuss their interests with the liberal arts adviser before making a decision.

Program in the History of Science and Technology

The College of Arts and Sciences and the Department of History at WVU have established a curriculum in the History of Science and Technology to stimulate the development of a more comprehensive and integrated approach to liberal education and to encourage wider use of the intellectual and technical resources available within the University. At the undergraduate level, there are introductory and upper-division courses in the history of science and technology offered through the Department of History. See page 171 for further information about the program.

Credit by Examination

Credit by examination provides students the opportunity to challenge courses in order to verify that they have acquired sufficient knowledge to earn credit without further study in the classroom. This opportunity to challenge a course does not include the opportunity to further instruction and/or tutoring by an instructor.

Any student may petition to receive credit by examination for any course listed by a department in the College of Arts and Sciences as one for which credit by examination is appropriately awarded. Applications, course lists, and examination schedules are available each semester at the Student Services Center.

A student may apply to challenge a course for credit by examination if: (a) the student is at the time of examination registered in the University; (b) the student's official record does not show credit for the course (i.e., any grade of S, P, A, B, C, D, or I); (c) the student is not officially enrolled in the course at the time of examination (A student who withdraws from a course after the end of the official registration period is officially enrolled in that course until the end of the semester, and not eligible to take the course by examination during that semester.); and (d) a grade of F has not been recorded on the student's record for the course within two calendar years of the date of the examination. A student may challenge the same course by examination only two times.

Credit only (not a grade) will be awarded for the successful completion of the examination with a grade of C or higher. Because a comprehensive examination is used to establish credit, it is the policy of the college that a student should demonstrate at least an average (C) knowledge of course content to receive any credit. The criteria for earning a C are to be made known in advance to students who request the information from the department offering the course examination.

A nonrefundable fee is charged for credit by examination and must be paid within the prescribed period prior to each examination period.

Regulations Affecting Degrees

Application for Graduation and Diploma

All candidates for degrees in the College of Arts and Sciences must fill out an application for graduation and diploma at the Academic Advising Center. Candidates should make such application during the second semester of their junior year in order to have their records evaluated as to College of Arts and Sciences and University requirements. Application *must* be made during the first month of the semester or session in which the candidate expects to be

graduated. If a student does not, for some reason, graduate on the date for which the student applied initially, the student must re-apply for a later date. No candidate can be graduated without application.

Bachelor of Arts Degree

The degree of Bachelor of Arts in the College of Arts and Sciences is conferred upon a student who complies with the general regulations of WVU concerning degrees and satisfies all entrance, college, and departmental requirements.

Bachelor of Science Degree

The degree of Bachelor of Science is conferred upon a student who complies with the general regulations of WVU concerning degrees, satisfies all entrance and college requirements, and completes the requirements for the Bachelor of Science degree in one of the following fields: Chemistry, Computer Science, Geology, Physics, and Statistics.

Requirements for Degrees

In order to qualify for graduation, students must fulfill the University requirements stipulated in Part 2 of the *Undergraduate Catalog*, as well as College of Arts and Sciences and degree program requirements:

College of Arts and Sciences Requirements

A. *Foreign Language:* Two years of study in one language. The student may satisfy this requirement by taking courses 1, 2, 3, and 4, or other approved courses, in one language. Students who present two or more units of high school credit in a foreign language may satisfy this requirement by taking courses 3 and 4, or other approved courses, in that language. Such students may elect to take courses 1 and/or 2 as additional preparation for courses 3 and 4. (For explanation of various options and other approved courses, see listings under "Foreign Languages" in the *Undergraduate Catalog.*) Courses used to fulfill this requirement are *in addition to* those used to fulfill the University Core A requirement.

B. *Mathematical Science:* Each student must satisfactorily complete a minimum of 3 semester hours in the mathematical sciences—mathematics, statistics, or computer science. Courses used to fulfill this requirement may simultaneously be used to fulfill the University Core C requirement.

C. *Laboratory Science:* Each student must satisfactorily complete at least one 4-credit laboratory course in a Core C field *other than* mathematics, statistics, or computer science. The College of Arts and Sciences strongly recommends a full year in one science. Courses used to fulfill this requirement may simultaneously be used to fulfill the University Core C requirement.

D. *Fine Arts:* Each student must satisfactorily complete a minimum of 3 semester hours focused on the fine arts—art, literature, music, theatre, etc. Courses used to fulfill this requirement are *in addition to* those used to fulfill the University Core A requirement. A list of acceptable courses is available at the Arts and Sciences' Academic Advising Office, the Office of the Dean, and from departmental advisers.

E. *International Studies:* Each student must satisfactorily complete 3 semester hours of study of a foreign culture or civilization other than that of Modern Western Europe or Canada. This requirement may be used simulta-

neously to satisfy core requirements, but no course used to satisfy the foreign language requirement may be used to fulfill this requirement. A list of acceptable courses is available at the College of Arts and Sciences' Academic Advising Office, the Office of the Dean, and from departmental advisers.

F. *Electives:* As approved by the adviser, to complete the minimum number of hours required for graduation.

G. *Grade-Point Average:* A cumulative average of 2.0 is required for graduation.

Degree Program Requirements

A. *Major Subject:* Requirements are listed separately in the *Catalog* by department or degree program. To establish a major sequence and to qualify for graduation, the student must have spent at least two semesters and have accumulated a minimum of 30 semester hours as a student in a degree program.

B. *Transfer Credit:* Except with the approval of the department or degree program chairperson, no upper-division course in the major, taken at another institution, will be counted toward meeting the requirements of the degree program.

C. *Grade-Point Average:* Individual departments or degree programs may require a grade-point average of 2.0 (C) or higher in the major, or a grade of C or higher for certain specified required courses. All departments and degree programs in the College require at least a 2.0 (C) cumulative grade-point average for admission; individual departments or programs may require a higher cumulative grade-point average.

D. *Credit Hours:* A total of 128 hours is required for the Bachelor of Arts degree. The Bachelor of Science degree in Computer Science, Geology, and Statistics requires 134 hours; in Chemistry and Physics, 136 hours.

Credit Limitations

The following may *not* be counted toward the hours required for graduation:

A. Mathematics 2. *(Course not offered after 1983-84.)*

B. Courses in which the grade received is other than A, B, C, D, P, or S. Credit by examination, however, is counted toward hours required for graduation unless it was granted for courses otherwise excluded in this list.

C. Any course passed more than once, unless a course is designated as repeatable and is so described in the *Catalog.*

D. More than 42 hours in one departmental subject for a Bachelor of Arts degree. (In the case of English language and literature, the 42-hour maximum is exclusive of credits in English 1 and 2.) As much as 60 hours may be presented from a department that offers more than one subject (e.g., Foreign Languages).

E. More than 8 hours of first- and second-year Military Science (ROTC) or Air Force Aerospace Studies (ROTC) courses.

F. More than 6 hours of third- and fourth-year Military Science (ROTC) or Air Force Aerospace Studies (ROTC) courses.

G. More than 72 hours of transfer credit from accredited junior or community colleges.

H. More than 18 semester hours of credit for which only a grade of P is recorded. (See Pass-Fail Grading, pages 38-39.)

I. Any course in which the final grade is F. The student must take the course again *in residence at WVU* if the student desires to receive credit for it.

Preparation for the Study of Dentistry, Law, or Medicine

Some students preparing for the study of dentistry or medicine may satisfy the requirements for entrance into dental or medical school by majoring in any College of Arts and Sciences subject and including in their undergraduate course selections the following minimum requirements or their equivalents: general biology with laboratory (2 semesters); inorganic chemistry with laboratory (2 semesters); organic chemistry with laboratory (2 semesters); introductory physics with laboratory (2 semesters); social or behavioral sciences (2 semesters), and English composition and rhetoric (2 semesters). These requirements overlap those of the University Core Curriculum, which must be satisfied by all students. All degree programs in the College of Arts and Sciences offer a major which accommodates the above courses. Some students are admitted to a school of dentistry or medicine after completing three years of undergraduate work. These students may earn the bachelor's degree by completing three years in the College of Arts and Sciences and one year in a dental or medical school, if, as in some cases, courses taken in the first year of dental or medical school may be credited to the degree program in the College of Arts and Sciences.

Admission to or completion of a preprofessional curriculum does not guarantee admission to a professional school. (See "Admission to Medical Center Programs," pages 19-20, and the appropriate *Catalog* sections describing admission to the professional school in question.)

No specific program of pre-law education is prescribed. Courses of study which demand intellectual self-discipline are encouraged. The ability to speak and write clearly, to order thoughts intelligently, and to use language accurately is highly desirable. Some background in accounting is helpful in understanding complex tax and corporate structure matters.

Courses of Instruction and Curricula

Orientation (Orien.)

1. *Orientation to University Life.* I, II. 1 hr. Open only to new students in their first semester at the University. Study of the values, orientation, and emphasis which characterize higher education and an explanation of the nature of a university and its role. *(Pass-Fail grading only.)*

51. *Career Series—Career Planning Exploration.* I, II. 1 hr. Exploration of careers with special emphasis on individual interests, abilities, and values. Most beneficial to freshmen and sophomores, but appropriate for juniors and seniors. *(Pass-Fail grading only.)*

52. *Career Series—Job Search.* I, II. 1 hr. PR: Orien. 51 recommended. Methods of looking for a job—employer expectations, interviewing, resumes, letter writing, etc. Should be taken next to last semester, but can be taken at other times. *(Pass-Fail grading only.)*

60. *Introduction to Health Careers.* II. 1 hr. A study of careers in the health professions. Readings, lectures, and discussions by professionals in many health fields will include the educational requirements for and functions of their respective health professions. *(Pass-Fail grading only.)*

120. *Leadership Development.* I. 2 hr. PR: Sophomore standing. Primarily for sophomores and juniors. A practical survey of leadership techniques taught by various instructors. Major emphasis placed upon improvement of leadership abilities within the WVU campus structure and problems particular to student organizations. *(Pass-Fail grading only.)*

150. *Orientation to Law.* I, II. 1 hr. An orientation to the legal profession for undergraduates. Undergraduate preparation for law school; Law School Admissions Test (LSAT); admission to law school, law school experience, and the legal profession. *(Pass-Fail grading only.)*

191. *Orientation Practicum.* I, II. 1 hr. PR: Sophomore or higher standing and consent. Students will participate in Orien. 1 as assistants to faculty teaching Orien. 1. Practicum form of study leading to an understanding of the values, orientations, and emphases which characterize higher education. *(Pass-Fail grading only.)*

Appalachian Studies

See Interdepartmental Majors, page 96.

Art History

See Interdepartmental Majors, pages 96-97.

Biology

Degrees Conferred: B.A., M.S., Ph.D.
Contact:
Martin W. Schein, *Chairperson*, 293-5394
Roy B. Clarkson, *Associate Chairperson*, 293-5201
Mullen O. Coover, *Associate Chairperson and Undergraduate Adviser*, 293-5201
Department is in 200 Brooks Hall.

Faculty

Professors

Nelle P. Ammons, Ph.D. (U. Pitt)—*Emerita.*
Charles H. Baer, Ph.D. (U. Md.)—*Emeritus.*
Herald D. Bennett, Ph.D. (U. Iowa)—*Emeritus.*
David F. Blaydes, Ph.D. (Ind. U.). Plant physiology, Cytokinins.
Melvin L. Brown, Ph.D. (WVU)—*Adjunct.* Systematic botany.
Roy L. Butcher, Ph.D. (Iowa St. U.)—*Adjunct.* Endocrinology, Reproductive physiology.
Roy B. Clarkson, Ph.D. (WVU)—*Associate Chair; Herbarium Curator.* Systematic botany.
William E. Collins, Ph.D. (U. Wisc.). Endocrinology, Animal science.
John J. DeCosta, Ph.D. (Ind. U.). Limnology, Ecology, Invertebrate biology.
Lloyd R. Gribble, Ph.D. (WVU)—*Emeritus.*
John E. Hall, Ph.D. (Purdue U.)—*Adjunct.* Parasitology.
Edward C. Keller, Jr., Ph.D. (Penn St. U.). Environmental science, Genetics, Science education.
Gerald E. Lang, Ph.D. (Rutgers U.)—*Assistant Dean.* Plant ecology, Biogeochemistry, Wetland ecology.
Martin W. Schein, Sc.D. (J. Hopkins U.)—*Chair.* Animal behavior, Circadian rhythms.
Richard P. Sutter, Ph.D. (Tufts U.). Cellular/molecular biology, Developmental biology, Molecular genetics.
Stanley Wearden, Ph.D. (Cornell U.)—*Adjunct.* Biostatistics.
Robert C. Whitmore, Ph.D. (B. Young U.)—*Adjunct.* Ornithology, Wildlife management.

Associate Professors

Mullen O. Coover, M.S. (WVU)—*Associate Chair.* Human physiology.

Dorothy C. Dunning, Ph.D. (Tufts U.). Animal behavior, Neurophysiology, Invertebrate biology.

Ramsey H. Frist, Ph.D. (U. Pitt). Cellular/molecular biology, Virology, Electron microscopy.

Roland B. Guthrie, Ph.D. (WVU)—*Arboretum Curator.* Plant anatomy, Dendrology, Plant geography.

Willis H. Hertig, Jr., Ph.D. (WVU). Conservation, Natural resources, Science education.

Joseph A. Marshall, Ph.D. (U. Md.). Animal behavior, Ichthyology, Aquaculture.

Ethel C. Montiegel, M.S. (WVU). Animal physiology, Vertebrate anatomy, Developmental biology.

Dennis C. Quinlan, Ph.D. (U. Rochester). Cellular/molecular biology, Cell membranes, Cancer biology.

Leah A. Williams, Ph.D. (WVU). Developmental biology, Vertebrate anatomy, Lens regeneration.

Assistant Professors

Arnold Benson, M.S. (U. Colo.). Aquatic ecology, Fishery science.

Ann L. Chester, Ph.D. (Duke U.)—*Visiting.* Plant ecology.

Carlos de la Rosa, Ph.D. (U. Pitt)—*Visiting.* Aquatic ecology, Invertebrate biology.

Sharon S. Erickson, Ph.D. (WVU)—*Visiting (part-time).* Plant physiology, Biochemistry.

Karl Havens, Ph.D. (WVU)—*Visiting.* Limnology, Ecology.

Karen S. Katula, Ph.D. (Northwestern U.). Cellular/molecular biology, Molecular genetics, Recombinant DNA.

James B. McGraw, Ph.D. (Duke U.). Plant ecology, Plant physiology.

Walter R. Statkiewicz, Ph.D. (WVU)—*Visiting (part-time).* Animal behavior, Science education.

Joseph B. Yavitt, Ph.D. (U. Wyo.)—*Visiting.* Plant ecology, Biogeochemistry.

Lecturer

Holly G. Ressetar, B.A. (WVU)—*(part-time).* Vertebrate anatomy.

Nature of Program

The Bachelor of Arts degree with a major in Biology is designed to prepare students for professional careers in the life sciences by way of several options. The required courses of the options provide preparation for graduate study in many of the specialized biological disciplines, for professional study in medicine, dentistry, or other health-related sciences, for secondary school teaching, or for technical careers in government and private industry. The options are: (1) General Biology—the standard program; (2) Environmental Science Technician; (3) Laboratory Science Technician; (4) Natural Science Technician; (5) Marine Science; and (6) Biobusiness.

Off-campus field experience in various aspects of marine biology is available in the summer at Wallops Island (Va.) Marine Station. Information regarding the program may be obtained by contacting the Chairperson, Department of Biology.

Admission Requirements

Admission to the degree program may be sought upon the completion of 58 hours with a 2.0 grade-point average and also requires at least a cumulative average of 2.0 for courses in biology. Upon admission to the degree program the student may select any one of the program options. Some movement between options is possible, but the student must work closely with an adviser to insure completion of requirements in at least one option. All options, except the Natural Science which does not require the 8 hours of physics, satisfy requirements for admission to most graduate and professional

schools. Students must maintain at least a 2.0 cumulative average for biology courses at WVU in order to retain status as a biology major and for graduation.

Degree Requirements

Minimum requirements for graduation with a degree in biology are 31 hours of biology courses. (*Note:* A maximum of 42 hours in biology may be counted towards meeting graduation requirements.) Biology electives must be selected from courses listed under Courses of Instruction in Biology; at least one of these electives must be a laboratory course. With the adviser's approval, courses in the College of Agriculture and Forestry and the School of Medicine may be selected to satisfy the elective requirement. The student should consult with the adviser in choosing biology electives and those general electives which satisfy both University and College of Arts and Sciences requirements.

Biology 209 may be repeated for up to 6 hours of credit but cannot be used as department elective hours.

Options

Courses Required for All Options

Biol. 1 and 3, 2 and 4, 101, 102, 103, 104—(24 hr.)

Chem. 15, 16, 133, 134, 135, 136—(16 hr.)

Math. 14 *or* 3 and 4 (may be waived on the basis of ACT test scores)—(4 or 6 hr.)

Math. 15 and 16 *or* Math. 128 *and* either statistics or computer science; Econ. 125 may be substituted for Stat. 101 in the Biobusiness option.—(8 or 6 hr.)

In addition to the above, the following are specific requirements in each of the options.

General Biology (Standard) Option

Phys. 1, 2—(8 hr.)

Biology electives—(7 or 8 hr.)

Biobusiness Option

Phys. 1, 2—(8 hr.)

Econ. 54, 55—(6 hr.)

Biology electives—(7 or 8 hr.)

Business electives—(18 hr.)

Environmental Science Technician Option

Phys. 1, 2—(8 hr.)

Biol. 217—(3 hr.)

Geology or Soils courses—(8 hr.)

Stat. 201—(3 hr.)

Students in this option may prepare themselves for future entry into the M.S.E. graduate program in the environmental area of Civil Engineering. Students planning for this work should take as many of the following courses as possible during their undergraduate programs: Math. 15, 16, 17, 18; M.E. 41; C.E. 120, 146, and 147. C.E. 147 should be given first priority.

Laboratory Science Technician Option

Phys. 1, 2—(8 hr.)
Biol. 216—(3 hr.)
Chem. 115, 141 and 142—(8 hr.)
Ag. Bi. 210—(3 hr.)

Marine Science Option

Phys. 1, 2—(8 hr.)
Biol. 255—(4 hr.)
Elective courses in Marine Sciences (usually taken during the summer at a marine biology station)—(9 hr.)

Natural Science Technician Option

Biol. 51, 151, 255—(10 hr.)
Summer field experience or equivalent courses at a field station—(6 hr.)

Honors Program

To be eligible for admission to the Departmental Honors Program, a student must have a 3.4 overall average, and must have the approval of the departmental honors faculty. Qualified students should consult their advisers about admission to the program.

Individual original research, a senior thesis, and seminar are a required part of the program.

Courses of Instruction in Biology (Biol.)

Lower Division

1. *General Biology.* I, II, S. 3 hr. Introductory course in biology: cellular, organismal, and population genetics, including reproduction, growth and development, and evolution.

2. *General Biology.* I, II, S. 3 hr. PR or Conc.: Biol. 4. Introductory biology: energetics and physiology of cells, organisms, and populations, including regulation and control of multicellular organisms.

3. *General Biology Laboratory.* I, II, S. 1 hr. PR or Conc.: Biol. 1. Experiments in biology: genetics and evolution; reproduction, growth, and development of cells, organisms, and populations.

4. *General Biology Laboratory.* I, II, S. 1 hr. PR or Conc.: Biol. 2. Experiments in biology: materials exchange, actions of enzymes, photosynthesis and respiration, and physiology of organisms.

51. *Dendrology (Angiosperms).* I. 3 hr. *(Primarily for Forestry students.)* Classification, identification, and distribution of angiosperm trees and shrubs of North America.

52. *Dendrology (Gymnosperms).* II. 1 hr. *(Primarily for Forestry students.)* Classification, identification, and distribution of gymnosperm trees and shrubs of North America.

61. *Introduction to Human Anatomy.* I. 4 hr. PR: Biol. 1 and 3 and 2 and 4 or equiv. An introduction to the study of human anatomy. The emphasis is on anatomy but the relationship of structure to function is an essential part of the course.

Upper Division

101. *Biology of Organisms 1.* I. 4 hr. PR: Biol. 1 and 3 and 2 and 4 or equiv. Adaptations of individual organisms, both plant and animal, to their environments are studied from an evolutionary perspective. Processes mediating these adaptations include reproduction, development, systematics, physiology and control mechanisms. Evidence evaluation stressed.

102. *Biology of Organisms 2.* II. 4 hr. PR: Biol. 1 and 3 and 2 and 4 or equiv. A continuation of Biol. 101. Adaptations of individual organisms, both plant and animal, to their environment and the processes mediating these adaptations are discussed from an evolutionary perspective. Evidence evaluation is stressed.

103. *Population Biology.* I. 4 hr. PR: Biol. 1 and 3 and 2 and 4, Math 4, or consent. Biological populations and their environmental relationships.

104. *Cellular and Molecular Biology.* II. 4 hr. PR: Biol. 1 and 3 and 2 and 4, general physics, organic chemistry, or consent. A study of cell structure and function beginning at the molecular level of organization and proceeding through different levels of complexity.

107. *Honors Investigation and Thesis.* I, II, S. 1-4 hr. (May be repeated for credit; max. credit 12 hr.) PR: Second semester of junior year, recommendation of adviser; biology majors only. Supervised readings, investigation, and study.

109. *Topics and Problems in Biology.* I, II, S. 1-4 hr. *(May be repeated for a max. of 6 hr.)* PR: Consent. Topics and problems in contemporary biology. All topics and problems must be selected in consultation with the instructor.

151. *Plant Systematics.* II. 4 hr. Classification, ecology, and identifications of local vascular plants.

152. *The Plant Kingdom.* I, S. 4 hr. PR: Biol. 1 and 3 and 2 and 4 or equiv. *(Not open to students having credit for Biol. 351, 352.)* Study of the evolution, structure, and development of plants beginning with simple plants and proceeding through various levels of complexity to the flowering plants. *(Offered in odd years.)*

166. *Human Physiology.* I, II. 3 hr. PR: Biol. 1 and 3 and 2 and 4 or consent. *(Intended for non-Biology majors.)* An introductory course in the function of the human.

169. *Plant Physiology.* II. 3 hr. PR: Chem. 15 and 16, or equiv. Physiochemical processes of plants.

194. *Field Experience.* I, II, S. 1-18 hr. PR: Departmental consent. Experience in the practical application of knowledge and skills appropriate to a degree in biology (no more than 18 hours of Biol. 194 may be counted toward the 128 hours required for the B.A. in Biology).

201. *History of Biology.* I. 3 hr. PR: Biol. 1 and 3 and 2 and 4 or equiv. History of development of biological knowledge, with philosophical and social backgrounds.

209. *Topics and Problems in Biology.* I, II, S. 1-4 hr. *(May be repeated for a max. of 6 hr.)* PR: Consent. Topics and problems in contemporary biology. All topics or problems must be selected in consultation with the instructor.

211. *Advanced Cellular/Molecular Biology.* II. 3 hr. PR: Biol. 104 or consent. Advanced study of fundamental cellular activities and their underlying molecular processes.

212. *Advanced Cellular/Molecular Biology—Laboratory.* II. 1 hr. PR or Conc.: Biol. 211 or consent. Experimental approaches to the study of cellular systems. (1 hr. lab.)

214. *Molecular Basis of Cellular Growth.* 3 hr. PR: Biol. 104 or consent. Study of the integration of molecular events as they regulate the growth and division of cells. Topics include: hormones as cell effectors, control of gene expression, and the cancer cell as a model system.

215. *Cytology.* II. 4 hr. PR: Biol. 1 and 3 and 2 and 4 or equiv. Cells, their structure and function.

216. *Cell and Molecular Biology Methods.* I. 3 hr. PR: Biol. 104 or consent. Introduction to the theory and application of basic analytical tools used in molecular biology. Selected topics included are: hydrodynamic methods, chromatography, electrophoresis, and general laboratory methods. *(Offered in Fall of even years.)*

217. *Methods in Ecology and Biogeochemistry.* II. 3 hr. PR: Biol. 103 and consent. Introduction to the theory and application of basic analytical tools used in ecology and biogeochemistry. Topics include sampling of terrestrial and aquatic organisms and their environment, and chemical analyses of biological materials. *(Offered in Spring of odd years.)*

231. *Animal Behavior.* I. 4 hr. PR: Biol. 1 and 3 and 2 and 4 or Psych. 1, or equiv. Introduction to animal behavior (ethology) emphasizing the biological bases and evolution of individual and social behaviors; laboratory includes independent investigation of behavioral phenomena.

232. *Physiological Psychology.* I. 3 hr. PR: 9 hr. psychology, behavior, physiology, or graduate standing. Introduction to physiological mechanisms and the neural basis of behavior. *(Also listed as Psych. 232.)*

233. *Behavioral Ecology.* II. (Alternate Years.) 3 hr. PR: Biol. 231 or consent. Consideration of the influences of environmental factors on the short and long term regulation, control, and evolution of the behaviors of animals.

234. *Physiology of Animal Behavior.* II. (Alternate Years.) 3 hr. PR: Biol. 231 or consent. Explores the way behavior is controlled in a wide variety of animals so that commonalities and varieties of neural and endocrine mechanisms may be better understood.

235. *Primate Behavior.* II. 3 hr. PR: Consent. Primates as they exist in their natural habitats, as they suggest clues to human behavior and the evolution of behavior. Case studies and comparative primate behavior of prosimians to monkeys, to apes, to human hunters and gatherers. *(Also listed as Soc. & A. 257.)*

242. *Acid Precipitation on Aquatic Ecosystems.* II. 3 hr. PR: Biol. 1 and 3, 2 and 4, or equiv. Acid precipitation and its effects on freshwater ecosystems including all biological communities as well as overall effects on system functions and studies to assess the recovery from whole lake treatments.

243. *Plant Ecology.* I. 4 hr. PR: Biol. 1 and 3 and 2 and 4 or equiv. Environmental and ecological relationships of plants.

246. *Limnology.* I. 4 hr. PR: Biol. 103 or consent. Physical, chemical, and biological characteristics of inland waters with an introduction to the principles of biological productivity.

247. *Aquaculture.* I. 3 hr. PR: One year general biology or consent. An introduction to the farming and husbandry of freshwater and marine organisms. *(Overnight field trips are voluntary.)*

250. *Aquatic Seed Plants.* I. 3 hr. PR: Biol. 1 and 3 and 2 and 4, or equiv. Classification, ecology, and economic importance of aquatic seed plants.

251. *Principles of Evolution.* I, S. 3 hr. PR: Biol. 1 and 3 and 2 and 4 or equiv. Introduction to the study of evolution.

252. *Flora of West Virginia.* II, S. 3 hr. PR: Biol. 1 and 3 and 2 and 4 or equiv. Consideration of the native plant life of the state.

253. *Structure of Vascular Plants.* II. 4 hr. PR: Biol. 1 and 3 and 2 and 4 or Pl. Sci. 52 or equiv. Development and evolution of vegetative and reproductive structures of vascular plants.

254. *Plant Geography.* II, S. 3 hr. PR: Biol. 1 and 3 and 2 and 4 or equiv. Study of plant groupings and worldwide distribution of plants.

255. *Invertebrate Zoology.* II. 4 hr. PR: Biol. 1 and 3 and 2 and 4 or equiv. Advanced study of animals without backbones.

256. *Ornithology.* II. 3 hr. PR: Biol. 1 and 3 and 2 and 4 or equiv. Lecture and laboratory studies on ancestry, evolution, topography, anatomy and physiology, systematics, behavior, migration, and ectoparasites of birds. Field studies will be limited in scope. *(Also listed as W. Man. 122.)*

257. *Ichthyology.* I. 3 hr. PR: Biol. 101 or consent. Internal and external structure of fishes, their systematic and ecological relationships, and their distribution in time and space. *(Dissection kit required.)*

258. *Mammalogy.* II. 3 hr. PR: Biol. 103 or W. Man. 224 and consent. Mammals and their biological properties with emphasis on life history, ecology, and distribution of regional forms. *(Also listed as W. Man. 225.)*

259. *General Parasitology.* II. 4 hr. PR: Biol. 1 and 3 and 2 and 4 or equiv. Introduction to the biology of parasites. *(Dissection kit required.) (Also listed as M. Bio. 224.)*

260. *Plant Development.* I. 4 hr. PR: Biol. 102, organic chemistry or biochemistry, or consent. Experimental studies of plant growth and development.

261. *Comparative Anatomy.* I. 4 hr. PR: Biol. 1 and 3 and 2 and 4 consent. A functional and evolutionary study of vertebrate structure. *(Dissection kit required.)*

262. *Vertebrate Embryology.* II. 4 hr. PR: Biol. 1 and 3 and 2 and 4 or consent. An experimental and descriptive analysis of vertebrate development.

263. *Vertebrate Microanatomy.* II. 5 hr. PR: Biol. 261 and consent. Structural and functional approach to the study of tissues and organs of vertebrates.

265. *Comparative Neuroanatomy.* I. 4 hr. PR: Biol. 261 and consent. Comparative study of development and anatomy of the nervous systems of the vertebrates. *(Dissection kit required.)*

268. *Physiology of the Endocrines.* I, S. 3 hr. PR: Biol. 102, or equiv., Ag. Bi. 210 or consent. Regulation of the organs of internal secretions and mechanisms of action of the hormones produced.

269. *Physiology of the Endocrines—Laboratory.* I. 1 hr. PR or Conc.: Biol. 268. Experimental techniques used in study of the endocrine system.

270. *General Animal Physiology.* I. 3 hr. PR: Biol. 1. In-depth, current treatment of physiological principles which operate at various levels of biological organization in animals of diverse taxonomic relationships. Understanding is developed from background lectures and student analysis in discussion sessions of research literature.

271. *General Animal Physiology—Laboratory.* I. 1 hr. PR or Conc.: Biol. 270. After learning basic techniques, students are provided the opportunity to design, execute, and report upon an independent research project in physiology.

309. *Topics and Problems in Biology.* I, II, S. 1-4 hr. PR: Consent. Topics and problems in contemporary biology, to be selected in consultation with the instructor.

311. *Biology Seminar.* I, II. 1 hr. Discussions and presentations of general interest to biologists.

315. *Molecular Basis of Virology.* I. 3 hr. PR: Biol. 104 or consent. Lectures on bacterial, animal and plant viruses; their structure, replication, and interaction with host cells. Discussion of the contributions virology has made to the understanding of molecular mechanisms in biology.

331. *Sociobiology.* I. (Alternate Years.) 3 hr. PR: Biol. 231 or equiv. Concepts in the biological bases of social behavior in animals. Emphasis is on the evolution of sociality and the principles underlying social interactions.

340. *Ecosystem Dynamics.* I. 3 hr. PR: Biol. 103 or equiv. Studies of modern approaches to ecosystem analysis. Emphasis will be on energy and material transfers. Approach will be holistic.

345. *Fisheries Science.* II. 4 hr. PR: Biol. 257 consent. Population dynamics in relation to principles and techniques of fish management. *(Offered in Spring of odd years.)*

346. *Production Limnology.* II. 3 hr. PR: Biol. 103 or 246 or equiv. Production in fresh-water ecosystems. Emphasis will be on methodology and results of research. Both primary and secondary production dynamics will be discussed.

352. *Plant Morphology (Bryophytes and Vascular Plants).* II. 4 hr. PR: Biol. 1 and 3 and 2 and 4 or equiv. Development and structure of the bryophytes and vascular plants. *(Offered in Spring of odd years.)*

354. *Fresh-Water Algae.* I. 4 hr. PR: Biol. 1 and 3 and 2 and 4 or equiv. Taxonomy, cytology, and ecology of aquatic, aerial, and land forms of fresh-water algae. *(Offered in Fall of even years.)*

355. *Advanced Plant Systematics 1.* II. 3 hr. PR: Biol. 151 or equiv. Taxonomy of pteridophytes, gymnosperms, and monocotyledons. *(Offered in Spring of odd years.)*

356. *Advanced Plant Systematics 2.* II. 3 hr. PR: Biol. 151 or equiv. Taxonomy of dicotyledons. *(Offered only in Spring of even years.)*

358. *Field Study of Invertebrates.* S. 3 hr. PR: Biol. 1 and 3 and 2 and 4 or equiv. Taxonomy and ecology of the invertebrates.

359. *Field Study of Vertebrates.* S. 3 hr. PR: Biol. 1 and 3 and 2 and 4 or equiv. Taxonomy and ecology of the vertebrates.

362. *Developmental Biology.* I. 3 hr. PR: Biol. 101, 102, 262 or equiv. and organic chemistry. The molecular and cellular basis of differentiation and morphogenesis. *(Offered in Fall of even years.)*

364. *Advanced Plant Physiology.* I, II. 3 hr. PR: Biol. 169 or equiv., organic chemistry, general physics, and consent. Advanced studies of plant processes including recent advances in the field. *I. Second Semester, odd-numbered years—Water relations and mineral nutritition and translocation. II. First Semester, odd-numbered years—Plant growth and development. III. Second Semester, even-numbered years—Environmental physiology.*

365. *Environmental Physiology.* II. 4 hr. PR: Biol. 101 or consent. Physiological mechanisms by which organisms adapt to their environments, comparing adaptations of phyletically different organisms to similar environments and the adaptations of similar organisms to different environments. *(Offered in Spring of even years.)*

375. *Fundamentals of Gerontology.* II. 3 hr. PR: MDS 50 or consent. An advanced multidisciplinary examination of current research in biological, psychological, and sociological issues of human aging and the ways in which these impinge on the individual to create both problems and new opportunities. *(Also listed as Psych. 375 and Soc. & A. 375.)*

Chemistry

Degrees Conferred: B.A., B.S., M.S., Ph.D.
Contact:
Anthony Winston, *Chairperson*, 293-4742
Chester W. Muth, *Associate Chairperson*, 293-4741
Department is in 217 and 222 Clark Hall.

Faculty

Professors

Nar S. Dalal, Ph.D. (U. Brit., Columbia). Physical chemistry, Magnetic resonance, Fossil fuels.
Gabor B. Fodor, Ph.D. (U. Szeged, Hungary)—*Centennial Professor.* Organic chemistry, Natural products, Synthesis.
John A. Gibson, Jr., Ph.D. (MIT)—*Emeritus.*
George A. Hall, Ph.D. (Ohio St. U.). Physical chemistry, Ornithology.
James L. Hall, Ph.D. (U. Wisc.)—*Emeritus.*
James B. Hickman, Ph.D. (Penn St. U.)—*Emeritus.*
George L. Humphrey, Ph.D. (Ore. St. U.)—*Emeritus.*
Denis W. H. MacDowell, Ph.D. (MIT). Organic chemistry, Synthesis, Thiophenes.
William R. Moore, Ph.D. (U. Minn.). Organic chemistry, Strained molecules, Reaction mechanisms.
Chester W. Muth, Ph.D. (Ohio St. U.)—*Associate Chair.* Organic chemistry, Synthesis, Antimalarials.
Robert S. Nakon, Ph.D. (Tex. A&M U.). Bioinorganic chemistry, Chelates, Catalysis.
Armine D. Paul, Ph.D. (U. Calif.). Inorganic and physical chemistry, Chemical education.
Jeffrey L. Petersen, Ph.D. (U. Wisc.). Physical inorganic chemistry, Transition metal complexes, X-ray diffraction.
Peter Popovich, Ph.D. (Wash. St. U.)—*Emeritus.*
Anthony Winston, Ph.D. (Duke U.)—*Chair.* Organic Chemistry, High polymers, Metal chelating polymers.

Associate Professors

Kenneth Showalter, Ph.D. (U. Colo.). Physical chemistry, Chemical kinetics, Multistability and oscillating systems.
Ronald B. Smart, Ph.D. (U. Mich.). Environmental analytical chemistry, Electrochemistry, Trace metals.
John H. Strohl, Ph.D. (U. Wisc.). Analytical chemistry, Thin-layer electrochemistry, Continuous electrolysis.

Assistant Professors

Daniel M. Downey, Ph.D. (LSU)—*Adjunct Research.*
Daniel J. Graham, Ph.D. (Wash. St. U.). Chemical physics, Low temperature spectroscopy, Optical-magnetic resonance.
Charles Jaffe, Ph.D. (U. Colo.). Theoretical chemistry, Molecular dynamics, Nonlinear mechanics.
Paul J. Jagodzinski, Ph.D. (Tex. A&M U.). Biophysical chemistry, Raman spectroscopy, Enzyme structures.
Eric A. Mintz, Ph.D. (U. Mass.). Inorganic and organometallic chemistry, Synthesis, catalysis.
John H. Penn, Ph.D. (U. Wisc.). Organic chemistry, Photochemistry, Electron transfer.
Kung K. Wang, Ph.D. (Purdue U.). Organic chemistry, Stereoselective synthesis, Natural products.

Nature of Program

The Department of Chemistry offers two degree programs: the Bachelor of Science in Chemistry and the Bachelor of Arts with a major in chemistry. These two programs are designed to meet the needs of all students who have an interest in the broad field of chemistry.

In the fall of 1985, the Department of Chemistry began its first full year in what is, in effect, a new building—a completely renovated Clark Hall. This total renovation has given the department a state-of-the-art facility for teaching undergraduate chemistry. Clark Hall now includes many new instruments, numerous safety features, excellent ventilation and ample hoods, and complete accessibility to the physically handicapped. In addition, the department has modern research facilities in the adjacent Chemistry Research Laboratory where advanced undergraduates may participate in research projects.

The Bachelor of Science degree is certified by the American Chemical Society. This program is designed for those students who desire to qualify for professional positions in industry and governmental services as well as those who plan to do graduate work in chemistry or allied areas in preparation for research careers in industry or coupled with university teaching.

The Bachelor of Arts degree with a major in chemistry is designed for those students who desire to go into careers which require a good background in the basic principles of chemistry. Areas such as medicine, dentistry, or other health-related sciences, secondary school teaching, chemical laboratory technical work, or even law or business may be pursued by proper choice of electives.

The two programs are similar during the first two years. Students in the B.S. program should complete the calculus requirement as soon as possible as a prerequisite for both the physics and physical chemistry sequences. The two degree programs differ primarily in the chemistry and foreign language requirements. The B.S. program requires a year of scientific German and more upper-level chemistry than is required in the B.A. program.

Admission Requirements

In addition to College requirements, admission to either program and continuance in each requires at least a cumulative average of 2.0 for courses in chemistry taken in the Department of Chemistry at WVU.

Degree Requirements

Bachelor of Science in Chemistry

A total of 136 hours is required, subject to the general course exclusions for all degrees. The College foreign language requirement must include two semesters of scientific German. The following courses are required: Chem. 17 and 18 or Chem. 15, 16, and 115; Chem. 133, 134, 135, 136, 201, 203, 210, 213, 222, 235, 246, 247, 248, 249, plus 12 hours of *approved chemistry electives*; Math. 15, 16, 17; Phys. 11, 12; Ger. 121, 122. The 12 hours of *approved chemistry electives* must be selected from the following courses: Chem. 192, 194, 202, 211, 212, 237, 239, 241, 243, 244, 250, 315, 331, 332, 341 subject to the restriction that only 6 hours of Chem. 192, 194 or 202, separately or combined, may be counted toward the 12-hour requirement. The following courses in other areas are recommended for consideration as general electives: Ag. Bi. 210 or 310; C.S. 1, 120; E.E. 272; Engl. 208; Math. 18, 113; Phys. 124, 225; Stat. 231.

Bachelor of Arts With a Major in Chemistry

The following courses are required: Chem. 15, 16, and 115, or Chem. 17 and 18; Chem. 133, 134, 135, 136, 141, 142 (concurrent with Chem. 141), plus 9 hours of *approved chemistry electives*; Biol. 1, 2; Math. 15, 16; Phys. 1, 2. The 9 hours of approved chemistry electives must be selected from the following

courses: Chem. 192, 194, 201, 202, 203, 210, 211, 212, 213, 235, 237, 239, 241, 243, 244, 315, 331, 332 subject to the restriction that only 6 hours of Chem. 192, 194, or 202, separately or combined, may be counted toward the 9-hour elective requirement.

Options

Students in the B.A. program may request to use Ag. Bi. 210 or 310 to meet part of the 9-hour chemistry elective requirement; however, at least 3 hours must be selected from chemistry courses numbered 210 or higher.

Students in the B.A. program may take Chem. 246, 247 and 248 in lieu of Chem. 141 and 142 and 3 hours of chemistry electives. Chem. 249 may be taken as 2 hours of chemistry elective.

Students in either degree program may seek admission to the *Departmental Honors Program.* A student must have a 3.5 average in chemistry courses taken at WVU and must have the endorsement of the chemistry faculty. A student may apply for admission to the program at any time after the student's first semester and no later than three semesters before graduation. The program includes a written report based upon a research project performed under the supervision of a member of the chemistry faculty. For further information a student should consult the Associate Chairperson.

Courses of Instruction in Chemistry (Chem.)

Note: A charge is made for breakage and supplies in laboratory courses and for failure to check out of the laboratory.

Lower Division

10. *Introduction to Chemistry.* I, II. 2 hr. Required for students whose performance on a departmental examination indicates need for introductory work before enrolling in other chemistry courses. Scientific terminology and concepts; chemical arithmetic; chemical symbols, formulae and equations; mole concepts; problem solving. May not count for credit toward graduation if taken after credit for another course in chemistry has been established. 1 hr. lec., 1 hr. rec.

11. *Survey of Chemistry.* I. 4 hr. PR: Satisfactory performance on departmental examination, or Chem. 10. Designed primarily for students taking only one year of college chemistry. Atomic structure; chemical bonding; acids, bases, and salts; periodicity; properties of gases, liquids, and solids; stoichiometry; oxidation-reduction. 2 hr. lec., 1 hr. rec., 3 hr. lab. *(Students may not receive credit for Chem. 15 or 17 and for Chem. 11.)*

12. *Survey of Chemistry.* II. 4 hr. PR: Chem. 11. Continuation of Chem. 11. Nuclear chemistry; air and water pollution; useful natural materials; consumer chemistry; introduction to organic and biochemistry. 2 hr. lec., 1 hr. rec., 3 hr. lab. *(Students may not receive credit for Chem. 16 or 18 and for Chem. 12.)*

15. *Fundamentals of Chemistry.* I, II. 4 hr. PR: Satisfactory performance on departmental examination, or grade of C or higher in Chem. 10. For students who need more than one year of college chemistry and for students in engineering. Develops terminology, conceptual foundations, and quantitative relationships on which subsequent courses in chemistry will be built. 2 hr. lec., 1 hr. rec., 3 hr. lab. *(Students may not receive credit for Chem. 17 and for Chem. 15.)*

16. *Fundamentals of Chemistry.* I, II. 4 hr. PR: Chem. 15. Continuation of Chem. 15. 2 hr. lec., 1 hr. rec., 3 hr. lab. *(Students may not receive credit for Chem. 18 and for Chem. 12 or 16.)*

17. *Principles of Chemistry.* I. 5 hr. PR: High school chemistry and satisfactory performance on departmental examination, or Chem. 10. A more advanced

treatment of the principles and theories of chemistry than offered in Chem. 15 and 16. Primarily for students specializing in chemistry. 3 hr. lec., two 3-hr. lab. *(Students may not receive credit for Chem. 17 and for Chem. 11 or 15.)*

18. *Principles of Chemistry.* II. 5 hr. PR: Chem. 17. Continuation of Chem. 17. 3 hr. lec., two 3-hr. lab. *(Students may not receive credit for Chem. 18 and for Chem. 12, 16, or 115.)*

Upper Division

115. *Introductory Analytical Chemistry.* I, II. 4 hr. PR: Chem. 16. Volumetric analysis, gravimetric analysis, solution equilibria, spectrophotometry, separations, and electrochemical methods of analysis. 2 hr. lec., two 3 hr. lab. *(Students may not receive credit for Chem. 115 and for Chem. 17 and 18.)*

131. *Organic Chemistry: Brief Course.* II. 4 hr. PR: Chem. 16. Emphasis on biological applications for students in medical technology, agriculture, and family resources. Nomenclature, structure, reactivity, and stereochemistry are stressed. 3 hr. lec., 3 hr. lab. *(Students may not receive credit for Chem. 131 and for Chem. 133 and 134.)*

133. *Organic Chemistry.* I, II. 3 hr. PR: Chem. 16 or 18 and 135 or concurrent enrollment. Basic principles of organic chemistry. Modern structural concepts, the effect of structure on physical and chemical properties, reactions and their mechanisms and application to syntheses. 3 hr. lec. *(Students may not receive credit for Chem. 133, 134, and for Chem. 131.)*

134. *Organic Chemistry.* I, II. 3 hr. PR: Chem. 133, 135, and 136 or concurrent enrollment in Chem. 136. Continuation of Chem. 133. 3 hr. lec.

135. *Organic Chemistry Laboratory.* I, II. 1 hr. PR or Conc.: Chem. 133. Fundamental organic reactions and the preparation of organic compounds. 3 hr. lab.

136. *Organic Chemistry Laboratory.* I, II. 1 hr. PR: Chem. 133, 135 and 134, or concurrent enrollment in Chem. 134. Continuation of Chem. 135. 3 hr. lab.

141. *Physical Chemistry: Brief Course.* I, II. 3 hr. PR: Chem. 16 (Chem. 115 if chemistry major.) Math. 16, Phys. 2 or 12. Beginning physical chemistry covering the subjects of chemical thermodynamics, chemical dynamics, and the structure of matter. 3 hr. lec. *(Students may not receive credit for Chem. 246 and 248 and for Chem. 141.)*

142. *Experimental Physical Chemistry.* I, II. 1 hr. PR or Conc: Chem. 141 or 246; Chem. 115, or Chem. 131, or Chem. 135. Laboratory work in physical chemistry designed to accompany Chem. 141. One 3-hr. lab.

192. *Undergraduate Research.* I, II. 1-3 hr. (May be repeated for credit.) PR: Written consent and a 3.0 grade-point average in chemistry courses. Individual investigations under supervision of an instructor. 3-9 hr. lab.

194. *Honors Course.* I, II. 1-3 hr. (May be repeated for credit.) PR: Written consent and at least a 3.5 average in chemistry courses taken in the department. Research for students in the departmental honors program. Thesis required.

201. *Chemical Literature.* I. 1 hr. PR: Chem. 134; Chem. 141 or 246. Study of techniques of locating, utilizing, and compiling information needed by research workers in chemistry. 1 hr. lec.

202. *Selected Topics.* I, II. 1-3 hr. (May be repeated for credit.) PR: Written consent, with at least a 2.0 grade-point average in chemistry courses. Individual instruction under supervision of an instructor.

203. *Undergraduate Seminar.* II. 1 hr. PR: Chem. 201. B.A. chemistry majors by consent. Instruction in design and presentation of topics of current chemical interest. 1 hr. individual instruction and/or lecture.

210. *Instrumental Analysis.* II. 2 hr. PR: Chem. 115, Physical chemistry. Lectures and demonstrations. Basic electronics, electrochemistry, spectroscopy, mass spectrometry, and gas chromatography. 2 hr. lec., 1 hr. demonstration

211. *Intermediate Analytical Chemistry.* I. 3 hr. PR: Chem. 115 and physical chemistry. Principles of analytical procedures and separations at an intermediate level. 3 hr. lec.

212. *Environmental Chemistry.* II. 3 hr. PR: Chem. 115, 134, and physical chemistry. Study of the nature, reactions, transport, and fates of chemical species in the environment.

213. *Instrumental Analysis Laboratory.* I. 1 hr. PR: Chem. 210. Experiments using modern chemical instrumentation. 3-hr. lab.

214. *Computer Interfacing Laboratory.* I. 1 hr. PR: Chem. 210; Conc.: Chem. 213. Computer interfacing of chemical instruments.

222. *Chemistry of Inorganic Compounds.* II. 3 hr. PR: Physical chemistry. Correlation of reactions and properties of elements and compounds based on modern theories of chemical bonding and structure. Acid-base theory, non-aqueous solvents, ligand field theory, and stereochemistry. 3 hr. lec.

235. *Methods of Structure Determination.* I. 4 hr. PR: Chem. 134 and 136. Use of chemical methods and uv, ir, nmr, esr, Raman and mass spectroscopy to elucidate structures of organic compounds. For students in chemistry and related fields who may need these methods in research and applied science. 2 hr. lec., two 3-hr. lab.

237. *Polymer Chemistry.* I. 3 hr. PR: Chem. 134 and physical chemistry. Methods, mechanisms, and underlying theory of polymerization. Structure and stereochemistry of polymers in relation to chemical, physical, and mechanical properties. 3 hr. lec.

239. *Organic Syntheses.* II. 3 hr. PR: Chem. 134, 136. Modern synthetic methods of organic chemistry. One 1-hr. lec., two 3-hr. lab.

241. *Crystallography.* I or II. 3 hr. PR or Conc.: Physical chemistry or consent. Applications of X-ray diffraction of crystals to study of crystal and molecular structure. Includes theories of diffraction and crystallographic methods of analysis. 3 hr. lec.

243. *Introduction to Radiochemistry and Radiation Chemistry.* I. 3 hr. PR or Conc.: Physical chemistry. Fundamentals of radiochemistry and the use of tracer techniques. An introduction to radiation chemistry and how ionizing radiation interacts with matter. 2 hr. lec., 3 hr. lab.

244. *Colloid and Surface Chemistry.* II. 3 hr. PR: Physical chemistry. Selected topics in the properties and physical chemistry of systems involving macromolecules, lyophobic colloids, and surfaces. 3 hr. lec.

246. *Physical Chemistry.* I. 3 hr. PR: Chem. 134, Math. 16, and Phys. 12. A first course in physical chemistry. Topics include a study of thermodynamics and chemical equilibria. 3 hr. lec. *(Students may not receive credit for Chem. 246 and for Chem. 141.)*

247. *Physical Chemistry Laboratory.* II. 1 hr. PR: Chem. 18 or 115 and Chem. 246. Experimentation illustrating the principles of physical chemistry and offering experience with chemical instrumentation. One 3-hr. lab.

248. *Physical Chemistry.* II. 3 hr. PR: Chem. 246 and Math. 17. Continuation of Chem. 246. Chemical dynamics and the structure of matter. 3 hr. lec. *(Students may not receive credit for Chem. 248 and for Chem. 141.)*

249. *Physical Chemistry Laboratory.* I. 2 hr. PR: Chem. 246, 247, 248. Continuation of Chem. 247. Two 3-hr. lab.

250. *Chemical Bonding and Molecular Structure.* I. 3 hr. PR: Chem. 248. Introduction to the quantum theory of chemical bonding. Atomic structure, theoretical spectroscopy, predictions of molecular structures and bond properties. 3 hr. lec.

315. *Chemical Separations.* I. 3 hr. PR: Chem. 115, 133, and physical chemistry. Modern methods of chromatography from a theoretical and practical standpoint. General principles of separation stressing the practical implementation of these principles with particular emphasis on high performance liquid chromatography and gas chromatography. 3 hr. lec.

331. *Advanced Organic Chemistry 1.* I. 3 hr. PR: Chem. 134. Structural concepts, bonding, tautomerism, static and dynamic stereochemistry, mechanistic classifications of reagents, and reactions including some applications. 3 hr. lec.

332. *Advanced Organic Chemistry 2.* II. 3 hr. PR: Chem. 331. Continuation of Chem. 331 with emphasis upon synthetic methods and reaction mechanisms. 3 hr. lec.

341. *Chemical Thermodynamics.* I or II. 3 hr. PR: Chem. 248. Principles of classical and statistical thermodynamics and their application to chemical problems. 3 hr. lec.

Comparative Literature

See Interdepartmental Majors, page 97.

Computer Science

Degrees Conferred: B.S., M.S.
Contact:
Donald F. Butcher, *Chairperson*, 293-3607
Malcolm G. Lane, *Director, Systems and Communications Laboratory*, 293-3607
Wayne A. Muth, *Associate Chairperson*, 293-3607
Y. V. Reddy, *Director, Artificial Intelligence Laboratory and Systems Programmers*, 293-3607
George E. Trapp, *Director, Computer Science Graduate Programs and Mathematical Computations Laboratory*, 293-3607
Stanley Wearden, *Pre-Computer Science Adviser*, 293-3607
Department is in 308 Knapp Hall

Faculty

Professors

Donald F. Butcher, Ph.D. (Iowa St. U.)—*Chair, Statistics and Computer Science.* Design and analysis of experiments, Monte Carlo simulation, Regression analysis.
E. James Harner, Jr., Ph.D. (Cornell U.). Statistics. Robust estimation, Statistical computation, Modeling observational studies.
Malcolm G. Lane, Ph.D. (Duke U.). Computer Science. Data communications, Operating systems, Software engineering.
Wayne A. Muth, Ph.D. (Iowa St. U.)—*Associate Chair, Computer Science.* Simulation, Mathematical modeling, Computer performance.
Y. V. Reddy, Ph.D. (WVU). Computer Science. Artifical intelligence, Knowledge based simulation, Computer graphics.
William V. Thayne, Ph.D. (U. Ill.). Statistics. Statistical genetics, Regression analysis.
George E. Trapp, Ph.D. (Carnegie-Mellon U.). Computer Science. Numerical analysis, Mathematical programming, Network models.
Stanley Wearden, Ph.D. (Cornell U.). Statistics. Biometrics, Statistical genetics, Population biology.

Associate Professors

John M. Atkins, Ph.D. (U. Pitt). Computer Science. Design of database management systems, Analysis of algorithms, Mathematics of computation.

William H. Dodrill, M.S. (Columbia U.). Computer Science. Microcomputer applications, Applications in medicine.

Shirley M. Dowdy, Ph.D. (U. Notre Dame). Statistics. Sampling statistical methods, Software for statistical education.

Erdogan Gunel, Ph.D. (SUNY—Buffalo). Statistics. Bayesian inference, Categorical data analysis, Biometry.

D. Michael Henry, Ph.D. (TCU). Computer Science. Databases, Cryptography, Micro interfacing.

Gerald R. Hobbs, Jr., Ph.D. (Kans. St. U.). Statistics. Nonparametric statistics, Regression analysis.

James D. Mooney, Ph.D. (Ohio St. U.). Computer Science. Operating systems, Text processing, Computer architecture.

Frances L. Van Scoy, Ph.D. (U. Va.). Computer Science. Programming languages and compilers, Software development environments, Parallel processing.

Assistant Professor

Rodolphe Nassif, Ph.D. (Inst. Natl. Poly., Fr.). Computer Science. Information systems, Distributed data base management systems.

Nature of Program

The Department of Statistics and Computer Science offers a degree program leading to a Bachelor of Science in Computer Science. The degree program is designed to qualify students for professional positions in business, industry, research, government service, or graduate study in computer science.

The computer science program is intended to educate students in the following areas of computer science: mathematical procedures, programming languages, systems programming, and information analysis. After taking an upper-division course in these areas (C.S. 220, 230, 240, and 260), students are encouraged to take advanced course work in areas of interest to them.

Admission Requirements

Pre-Computer Science Program of Study

General requirements for admission to the pre-Computer Science program of study are that all prospective students must qualify for admission to WVU and to the College of Arts and Sciences and present secondary school credit for 2 units of algebra, 1 unit of geometry, and ½ unit of trigonometry or advanced mathematics or 1 unit of chemistry or physics.

Additional Admission Requirements: Applicants must take the Standard ACT test and automatic admission to pre-Computer Science will be based on the following:

West Virginia residents must satisfy any two of requirements (a), (b), and (c) as herein described: (a) a high school grade-point average of at least 3.0; (b) a Standard ACT Mathematics score of at least 22; and (c) a Standard ACT Composite Score of at least 22.

Out-of-State residents must satisfy any two requirements (d), (e), and (f) as herein described: (d) a high school grade-point average of at least 3.3; (e) a Standard ACT Mathematics Score of at least 24; and (f) a Standard ACT Composite Score of at least 24.

Applicants not satisfying these admission requirements may gain admission to pre-Computer Science as transfer students as described below.

Transfer Students: Students wishing to transfer into pre-Computer Science or Computer Science, must satisfy WVU admission requirements, Arts and Sciences admission requirements, and must petition the Department of Statistics and Computer Science for admission. Petitions should be addressed to the Computer Science Academic Standards Committee, include

a transcript of all college level course work attempted, and indicate when the student would like to transfer to Computer Science (May or August). Petitions are evaluated about April 1 for May admission and about July 15 for August admission. Transfer students are normally accepted for January admission—an exception might be made in a case where the student has some appropriate previous experience in computing.

It is normally expected that transfer students will: (1) Have a grade-point average of at least 3.0 for all college-level work attempted; (2) Have earned at least a C in Mathematics 15 and 16 and have at least a 2.5 grade-point average on all computer science, mathematics, and statistics course work attempted; (3) Have satisfied requirements listed below under "Admission to Computer Science Degree Program" on all Computer Science course work attempted.

The number of transfer students accepted into the department will be governed by the enrollment capacities of the degree programs. First admission priority will be granted to those students currently matriculated at WVU; second priority to students enrolled in computer science curricula at external colleges and universities; third priority to students enrolled in other degree programs at external colleges and universities. Within the last two priorities, preferential admission will be in the following order: West Virginia residents, U.S. citizens or permanent residents, and international students.

Computer Science Degree Program

To be admitted to the bachelor of science degree program in computer science, students must:

a. Earn at least a C in C.S. 1 before enrolling in C.S. 2.

b. Earn at least a C in C.S. 2 and a 2.5 grade-point average in C.S. 1 and 2 before enrolling in C.S. 50.

c. Earn at least a C in each of C.S. 50 and C.S. 51 and a 2.5 grade-point average in C.S. 50-51.

d. Earn at least a C in each of Math. 15 and 16.

Students are allowed to repeat only one course out of C.S. 1 and 2 and only one course out of C.S. 50 and 51; the first grade in any repeated course (of these four courses) will be disregarded for the purpose of meeting admission requirements.

No student may enroll in any 200-level computer science course until the previously stated requirements involving C.S. 1, 2, 50, 51 are fully met.

Degree Requirements

Computer science majors must complete at least 60 hours of upper-division course work with at least 23 hours of upper-division course work in computer science, 3 hours of approved technical electives, and 3 hours in statistics. A student must earn at least a C in all courses counted towards meeting the upper-division hours in computer science, statistics, and approved technical electives.

Students who receive an unsatisfactory grade in a computer science course (D, F, W, WU, U) will be allowed to repeat the course once and only once, except that students with valid medical or emergency reasons for failing to satisfactorily complete a course in two attempts may petition the departmental Academic Standards Committee for permission to register for the course.

Required courses are: Math. 15, 16; Stat. 201; C.S. 1, 2, 50, 51, 120, 196, 220, 230, 240, 260; 6 additional hours of 200-level computer science course work; plus 3 additional hours of an approved technical elective. Approved

technical electives are: Any 200-level computer science course; any 300-level computer science course excluding C.S. 301; Stat. 221; Math. 241; E.E. 271, 272, 372, 373, 374; I.E. 283, 284.

At least 60 hours of upper-division course work must be included in the 134 hours required for graduation. Not more than 10 hours of 190-199 course work may count in the upper-division requirements.

Courses of Instruction in Computer Science (C.S.)

Lower Division

1. *Introduction to Computer Science.* I, S. 4 hr. Algorithms, programs and computers. Organization and characteristics of computers. Basic programming structure.

2. *Computer Language Concepts.* II, S. 4 hr. PR: C.S. 1 or equiv. Advanced programming using the PL/I Programming Language. Major topics include: structured programming techniques, file organizations and implementations, and list processing. Realistic programming assignments are used to illustrate solution techniques.

5. *Computer Applications for Business.* I, II. 4 hr. Algorithms, programs and computers. Organization and characteristics of computers. Basic program structure. Programming in the FORTRAN language. Emphasis on business applications.

50. *Computer Organization and Assembler Programming.* I. 4 hr. PR: C.S. 2. Introduction to the organization of a computer and to programming in an assembler language. Major topics include number systems, machine language, subroutine linkage, arithmetic operations, input and output, and macros.

51. *Principles of Computer Science.* II. 4 hr. PR: C.S. 2. Data structures, algorithms, and advanced programming techniques. Topics include linking subroutines from libraries, stacks, queues and lists, memory management, trees, searching algorithms, sorting algorithms, and analysis of algorithms.

60. *Introduction to COBOL Programming.* I. 3 hr. PR: A high-level programming language. COBOL programming assignments will be used to illustrate many features of the language, including the ability to manipulate different types of files.

Upper Division

120. *Discrete Mathematics 1.* I, II. 3 hr. PR: Math. 15 and C.S. 1 or equiv. Graph theory, matrix representations, sets, relations, shortest path, and minimal spanning tree algorithms. Matrix algebra. Finite automata and regular expressions. Queueing theory. Computer applications emphasized. *(Equiv. to Math. 120.)*

190. *Teaching Practicum.* I, II, S. 1-6 hr. (May be repeated for a maximum of 6 hours.) PR: C.S. 51. Practical classroom experience for undergraduate teaching assistants. Tasks assigned are those designed to provide experience with course design, implementation, evaluation and revision of classroom work.

191. *Special Topics.* I, II, S. 1-6 hr. PR: Consent. Advanced study of special topics in computer science.

195. *Field Experience.* I, II, S. 1-18 hr. PR: C.S. 51. *(Total credit applicable toward any Arts and Sciences degrees may not exceed the maximum of 18 hours.)* Course for those who wish to work with faculty and field supervisors to design field experiences with planned learning objectives and credit goals.

196. *Computer Science Seminar.* I, II. 1 hr. PR: C.S. 51. Satisfactory completion of the course requires that the student present a 20- to 50-minute talk on a selected topic and attend all scheduled meetings.

197. *Computer Science Practicum.* I, II, S. 1 hr. PR: C.S. 51. *(Open to computer science majors only.)* Assisting in operation of a computer to become familiar with computer and peripheral devices.

220. *Numerical Analysis 1.* I, II. 3 hr. PR: Math. 17 or C.S. 120 and a programming language. Computer arithmetic, roots of equations, interpolation, Gaussian Elimination, numerical integration and differentiation. Numerical solution of initial value problems for ordinary differential equations. Least square approximations. *(Equiv. to Math. 220.)*

221. *Numerical Analysis 2.* I, II. 3 hr. PR: C.S. 220 and Math. 241 or consent. Solutions of linear systems by direct and iterative methods. Calculation of eigenvalues, eigenvectors, and inverses of matrices. Applications to ordinary and partial differential equations. *(Equiv. to Math. 221.)*

228. *Discrete Mathematics 2.* II. 3 hr. PR: C.S. 120 and Math. 16 or equiv. Applications of discrete mathematics to computer science. Methods of solving homogeneous and non-homogeneous recurrence relations using generating functions and characteristic equations; digraphs to analyze computer algorithms; graph theory and its ramifications to computer algorithms. *(Equiv. to Math. 228.)*

230. *Programming Languages.* I, II. 3 hr. PR: C.S. 51. Formal definition of programming languages including specification of syntax and semantics. Structure of simple statements and algorithmic languages. List processing and string manipulation languages.

240. *Systems Programming.* I, II. 4 hr. PR: C.S. 51. Software organization for the support of computer components. Addressing techniques, process and data modules, file system organization and management. Traffic control and communication with peripheral devices.

241. *Systems Programming.* II. 3 hr. PR: C.S. 240. Memory management; name management; file systems; segmentation; protection; resource allocation; pragmatic aspects in the design and analysis of operating systems.

245. *Microcomputer Programming and Interfacing.* II. 3 hr. PR: C.S. 51. Detailed study of a typical microcomputer system including its architecture, operating system, assembly language programming, data communication, computer networking and microcomputer applications 3 hr. lec., 1 2-hr. lab.

260. *Information Analysis.* I, II. 3 hr. PR: C.S. 51. Information analysis and logical design of a computer system. Exercises and case studies are used to give students proficiency in information analysis techniques. Projects are assigned to provide practical experience in systems development and implementation.

270. *System Design.* I. 3 hr. PR: C.S. 51 or consent. Underlying principles of system design and techniques. A theme to be carried throughout the course is the iterative nature of the analysis and design process. Implementation and conversion problems also are considered. Practical projects are assigned to give students experience in actual situations.

281. *Introduction to Artificial Intelligence.* I. 3 hr. PR: C.S. 51 or consent. Introductory treatment of foundations of AI and the symbol manipulation language LISP. Survey of the field of AI, production systems, search strategies, game playing, knowledge engineering, weak methods. Applications of AI will be briefly studied.

285. *Computer Organization and Architecture.* I. 3 hr. PR: C.S. 50 and 51. Architecture of current computers and their effects on software design. Von Neumann machines; gates and registers; instruction and address decoding; memory systems; input-output systems; micros, supercomputers, specialized systems.

291. *Topics in Computer Science.* I, II, S. 3 hr. PR: C.S. 51 or equiv. Advanced study of topics in computer science.

301. *Computers in Research.* I. 3 hr. *(Statistics and Computer Science majors should obtain their graduate committee approval before registering.)* Use of computers in research. Algorithms and programming. Scientific and statistical programming packages.

303. *Microcomputers in Mathematics/Science.* S. 3 hr. PR: Math. 3 or consent. An integrated course in computer science, statistics, and mathematics for secondary educators. Focuses on programming techniques and uses problems from the areas of statistics and mathematics at the high school level as examples.

310. *Application Programming 1.* I. 3 hr. PR: Programming knowledge. Survey of computer application areas by industry, and summary of basic techniques used in computer applications problems, illustrated with real world examples. Options and decisions involved in problem solving emphasized.

311. *Application Programming 2.* II. 3 hr. PR: C.S. 51 or consent. Continuation of C.S. 310 where students work on a particular project under supervision of a faculty member and present a written and oral report on their project.

320. *Solution of Nonlinear Systems.* II. 3 hr. PR: C.S. 200 or Math. 241 or consent. Solution of nonlinear systems of equations. Newton and Secant Methods. Unconstrained optimization. Nonlinear overrelaxation techniques. Nonlinear least squares problems. *(Equiv. to Math. 320.)*

325. *Numerical Interpolation and Approximation.* II. 3 hr. PR: C.S. 220 or consent. Interpolation and approximation using Chebychev polynomials, Pade approximations, Chebychev economization of Taylor Series. Hermite interpolation, orthogonal polynomials and Gaussian Quadrature. *(Course will not be offered in 1986-87.)*

330. *Design of Language Processors.* II. 3 hr. PR: C.S. 230. Study of the design and construction of automatic programming language processors. Investigation of the structure of scientific and business oriented compilers, list processors, and information processing languages.

340. *Theory of Operating Systems.* I. 3 hr. PR: C.S. 240. Theoretical aspects of multiprogrammed and virtual operating systems. Topics include: concurrent processes, processor management, storage management, scheduling algorithms, and resource protection. *(Course will not be offered in 1986-87.)*

341. *Computer Science.* II. 3 hr. PR: C.S. 340 and Stat. 312, or consent. Simulation, evaluation, and measurement of computer systems. Techniques of measurement and evaluation using hardware and software monitors, methods of model validation, and creation of management reports. *(Course will not be offered in 1986-87.)*

350. *Software Engineering in Data Communications.* I. 3 hr. PR: C.S. 240 or consent. Data communications principles, software design techniques for implementing data communications systems, testing and debugging techniques, networks and data link control, software design in a network environment. A "hands-on" project in data communications design is included.

360. *Design of Database Systems.* I. 3 hr. PR: C.S. 260 or consent. Design, evaluation, implementation, and user interface of database systems. Topics include: storage structures, data languages, security, and relational, hierarchical and network implementation approaches.

370. *System Implementation.* II. 3 hr. PR: C.S. 220 or 260 or consent. Underlying principles of system implementation are covered both from a theoretical and from a practical point of view. As part of the course, each student will participate with other students in the implementation of a production system.

380. *Interactive Computer Graphics.* II. 3 hr. PR: C.S. 230 or 240 or 260 or consent. Data structures and list handling; picture structures and transformations; rendering of surfaces and solids; interaction handling; display processors and programming systems; and graphics system organization.

Economics

Degree Conferred: B.A.
Contact: Donald R. Adams, *Chairperson*, 293-5721
Department is in 208-B Armstrong Hall

Faculty

Professors

Donald R. Adams, Jr., Ph.D. (U. Penn). American economic history, European economic history, Economic development.

Vance Q. Alvis, Ph.D. (U. Va.). Money and banking, International economics, Public finance.

Lewis C. Bell, Ph.D. (U. Ky.). Public finance, Economics education.

Robert D. Britt, Ph.D. (U. Colo.). Managerial economics, History of economic thought, Economic history.

Ming-jeng Hwang, Ph.D. (Tex. A&M U.). General theory, Urban and regional economics, Mathematical economics.

Andrew W. Isserman, Ph.D. (U. Penn). Regional economics.

Arthur Kraft, Ph.D. (SUNY). Financial institution, Human resources economics, Money and banking.

Kern O. Kymn, Ph.D. (U. Chicago). General theory, Mathematical economics, Econometrics.

Walter C. Labys, Ph.D. (Nottingham U.)—*Adjunct.* Commodity market modeling, Mineral economics, Econometrics.

Patrick C. Mann, Ph.D. (Ind. U.). Utility economics, Industrial organization.

Tom S. Witt, Ph.D. (Wash. U.—St. Louis). Econometrics, Energy economics, Regional economics.

Associate Professors

Jagdeep Bhandari, Ph.D. (SMU). International finance, International trade, Economic development.

Stuart Dorsey, Ph.D. (Wash. U.—St. Louis). Labor economics, Monetary theory, Fiscal policy.

Clifford B. Hawley, Ph.D. (Duke U.). Labor economics, Microeconomics theory, Econometrics.

Douglas Mitchell, Ph.D. (Princeton U.). Monetary theory, Macroeconomics theory.

Assistant Professors

Paul Beaumont, Ph.D. (U. Penn)—*Visiting.* Econometrics, Regional economics.

Christopher Cornwell, Ph.D. (Mich. St. U.). Econometrics, Labor economics, Public finance.

Brian J. Cushing, Ph.D. (U. Md.). Urban and regional economics, Econometrics, Public finance.

Adrian H. Dierx, Ph.D. (U. Pitt). Urban and regional economics, Econometrics.

Parviz Jenab, Ph.D. (Ind. U.). Economic development, International economics.

Morteza Rahmatian, Ph.D. (U. Wyo.). Resource economics, Environmental economics, Microeconomic theory.

Peter Rupert, M.A. (U. Rochester). Labor economics, Microeconomic theory, International economics.

Paul J. Speaker, Ph.D. (Purdue U.). General theory, Econometrics, Finance.

William Trumbull, Ph.D. (U. N.C.). Public finance, Law and economics, Applied microeconomics.

Royce J. Watts, M.S. (WVU). Statistics.

Nature of Program

The College of Business and Economics offers all courses in economics, but these are recognized as a regular part of the program of the College of Arts and Sciences. The College of Business and Economics grants the degree of Bachelor of Science in Economics (B.S.). The College of Arts and Sciences grants the B.A. degree with a major in Economics.

The program leading to the B.A. degree is designed for students who wish to combine fundamental training in economics with a liberal arts education. The Core Curriculum requirements must be met in the choice of electives. Of the total 128 hours required for graduation, some 40 or more credit hours are available for elective subjects.

Admission Requirements

Students making application for initial admission to the major in economics program on or after May 15, 1985, must meet the following requirements: (1) completion of 58 or more credit hours with a cumulative grade-point average of 2.5 or better; (2) completion of each of the following courses with a grade of C or better: Econ. 54 and 55, Econ. 125, and Math. 3 or 14 or 15; (3) completion of Engl. 1 and 2, and a Mathematics sequence consisting of Math. 3 (or 14) and 128, or Math. 15 and 16.

Degree Requirements

Econ. 54, 55, 125, 211, 212, and one of the following courses: Econ. 110, 216, and 270. The student must take at least two non-economics courses in Core B, and must select one of the following courses sequences: Math. 3 and 128, Math. 15 and 16. The mathematics courses are to be credited toward the minimum of 12 hours required in Core C. Any student planning to pursue graduate work in economics should take Math. 15 and 16. Additional recommended courses can be determined in consultation with an economics adviser.

Majors are also required to take 15 additional hours of economics courses numbered 100 or above. A minimum of 27 upper-division course hours in economics is required of economics majors. Students majoring in economics must maintain a grade-point average of 2.0 (C) or better from courses in economics.

Courses of Instruction in Economics (Econ.)

Lower Division

51. *The Economic System.* I, II. 3 hr. Introduction to the analysis of the economic system. Pricing system, monetary system, determination of national income and employment. A one-semester principles course for non-majors.

54. *Principles of Economics.* I, II. 3 hr. PR: Sophomore standing. Introductory microeconomic analysis. Competitive behavior of firms, price determination, efficiency in production and equity in distribution.

55. *Principles of Economics.* I, II. 3 hr. PR: Sophomore standing. (Students are encouraged to take Econ. 54 before taking Econ. 55.) Introductory macroeconomic analysis. Aggregate demand and supply, saving, investment, the level of employment and national income determination, monetary and fiscal policy.

Upper Division

110. *Comparative Economic Systems.* I or II. 3 hr. PR: Econ. 54, 55. Structure and processes of existing economic systems throughout the world including review of basic principles of free enterprise, socialistic, communistic, and fascistic societies. Comprehensive analysis based on current and recent experiments in these economies.

125. *Elementary Business and Economic Statistics.* I, II, S. 3 hr. PR: Grade of C or better in either Math. 3 or Math. 14 or consent. Basic concepts of statistical models, distributions, probability, random variables, tests of hypotheses, confidence intervals, regression and correlation with emphasis on business and economic examples. *(Equiv. to Stat. 101.)*

130. *Money and Banking.* I, II. 3 hr. PR: Econ. 54, 55. The U.S. monetary and banking system and its functional relationship to the economic system; monetary theory and policy.

160. *Labor Economics.* I, II, S. 3 hr. PR: Econ. 54, 55. Survey of labor in the United States economy. Introduction to theories of employment and wage determination. Topics include labor history and law, the changing work roles of women, minority opportunities, and the problem of unemployment.

200. *Special Topics.* I, II, S. 1-4 hr. PR: Econ. 54, 55 or consent. Special topics relevant to economics. *(Maximum of 9 semester hours in any or all courses numbered 200 offered by the College of Business and Economics may be applied toward the bachelor's and master's degrees.)*

205. *Current Economic Problems.* S. 3 hr. PR: Econ. 54, 55 or consent. *(For students in Education only.)* Acquaints public school teachers with reliable source materials in economics and instructs them in studying current economic problems.

211. *Intermediate Microeconomic Theory.* I, II. 3 hr. PR: Econ. 54. Consumer choice and demand; economics of time; price and output determination and resource allocation in the firm and market under a variety of competitive conditions; welfare economics, externalities, public goods, and market failure.

212. *Intermediate Macroeconomic Theory.* I, II. 3 hr. PR: Econ. 54, 55. Forces which determine the level of income, employment, and output. Particular attention to consumer behavior, investment determination, and government fiscal policy.

213. *Economic Development.* I or II. 3 hr. PR: Econ. 54, 55. The problems, changes, and principal policy issues faced by nonindustrialized countries.

216. *History of Economic Thought.* I or II. 3 hr. PR: Econ. 54, 55. Economic ideas in perspective of historic development.

220. *Introduction to Mathematical Economics.* I or II. 3 hr. PR: Math. 15 or 128, and Econ. 54, 55; or consent. Principal mathematical techniques including set operation, matrix algebra, differential and integral calculus employed in economic analysis. Particular attention given to static (or equilibrium) analysis, comparative-static analysis and optimization problems in economics.

225. *Applied Business and Economic Statistics.* I, II. 3 hr. PR: Econ. 125 or Stat. 101 or consent. Continuation of Econ. 125. Principal statistical methods used in applied business and economic research including multiple regression, index numbers, time series analysis, forecasting models and methods, and sampling design.

226. *Introductory Econometrics.* II. 3 hr. PR: Econ. 54 and 55 (or 51) and Econ. 125 or Stat. 101. Statistical methods applied to the analysis of economic models and data. Emphasis placed on multiple regression, multicollinearity, seasonality, heteroscedasticity, autocorrelation, dummy variables, time series analysis, distributed lags and simultaneous equations with economics and computer applications.

241. *Public Finance.* I, II. 3 hr. PR: Econ. 54, 55. Governmental fiscal organizations and policy; taxes and tax systems with particular emphasis on federal government and state of West Virginia.

245. *Government and Business.* I, II. 3 hr. PR: Econ. 54, 55. Market structure, conduct and performance: analysis of the antitrust laws—judicial interpretation and effect on the business sector.

246. *Transportation Economics.* I. 3 hr. PR: Econ. 54, 55. Economic and institutional analysis of the domestic transportation system of the United States. Topics include role of transportation, carrier characteristics and services, transportation rates and costs, regulation of transportation.

250. *International Economics.* I or II. 3 hr. PR: Econ. 54, 55. Development of trade among nations; theories of trade; policies, physical factors, trends, and barriers in international economics.

255. *Regional Economics.* I. 3 hr. PR: Econ. 54, 55. Analysis of the regional economy's spatial dimension, emphasizing interregional capital and labor mobility, the role of cities, objectives and issues of regional policy, lagging regions and Appalachia, growth poles, and regional growth and income distribution.

257. *Urban Economics.* II. 3 hr. PR: Econ. 54, 55. Analysis of spatial dimensions of the urban economy, emphasizing both urban economic theory and urban policy. Issues include cities and income inequality, urban upgrading function, blight, economics of ghettos, the economies of urban size.

262. *Collective Bargaining.* I or II. 3 hr. PR: Econ. 160 or consent. Theory and practice of collective bargaining; including contract issues, types of relationships, and the role of government policy.

270. *Growth of the American Economy.* I or II. 3 hr. PR: Econ. 54, 55. Central issues in the development of the American economy.

297. *Internship.* I, II, S. 1-12 hr. PR: Econ. 54, 55 and departmental approval. Field experience in the analysis and solution of economic problems in the public and private sectors.

299. *Readings in Economics.* I, II, S. 1-3 hr. PR: Econ. 54, 55. Students will develop and carry out a program of specialized readings under the supervision of a cooperating instructor.

English Language and Literature

Degrees Conferred: B.A., M.A., Ph.D.
Contact:
Rudolph P. Almasy, *Chairperson*, 293-5021
Elizabeth Madison, *Assistant Chairperson*, 293-5021
Nicholas G. Ehle, Jr., *Department Adviser*, 293-3107
Department is in 228 Stansbury Hall

Faculty

Professors

Sophia B. Blaydes, Ph.D. (Ind. U.). 17th and 18th century literature, Poetry, Biography.
Philip Bordinat, Ph.D. (U. Birmingham, Eng.). 16th and 17th century British drama, Modern drama.
Lloyd M. Davis, M.A. (Vanderbilt U.). American literature, Creative writing, Humor in literature.
Ruel E. Foster, Ph.D. (Vanderbilt U.)—*Claude Worthington Benedum Professor of American Literature.* Southern literature.

Elaine K. Ginsberg, Ph.D. (U. Okla.)—*Assistant Vice President for Undergraduate Education.* Early American literature, American fiction, Women's studies.
John L. Hicks, Jr., M.A. (Ind. U.)—*Emeritus.*
John H. Johnston, Ph.D. (U. Wisc.). Modern poetry, War literature, Poetry of the city.
Virgil L. Peterson, Ph.D. (UCLA). Writing, Biography, Peace studies.
John Racin, Jr., Ph.D. (Ohio St. U.). Renaissance poetry and prose, Classical and modern drama, Shakespeare.
John F. Stasny, M.A. (U. Minn.). Victorian studies, Journal editing, Humanities.
Judith G. Stitzel, Ph.D. (U. Minn.)—*Director, Center for Women's Studies.* Women's studies, Feminist pedagogy.

Associate Professors

Rudolph P. Almasy, Ph.D. (U. Minn.)—*Chair.* Renaissance and Reformation studies, Composition.
Arthur C. Buck, Ph.D. (U. Ark.). Comparative and world literature, Comparative romanticism and comparative modern drama, Chinese and Japanese literature in translation.
Robert W. Clarke, Ph.D. (U. Wisc.). British romanticism, 19th century novel.
Patrick Conner, Ph.D. (U. Md.). Old English language and literature, Linguistics.
Oreta H. Dawson, M.A. (WVU)—*Emerita.*
Richard B. Eaton, Jr., Ph.D. (U. N.C.). American drama, 19th century American fiction.
William P. Fitzpatrick, Ph.D. (U. Md.). 20th century British novel, Short story, Myth and literature.
William W. French, Ph.D. (U. Pitt). Shakespeare, Renaissance literature, Drama and theatre history.
Anita Gandolfo, Ph.D. (CUNY). Modern literature, Literature and religion, Composition.
Avery F. Gaskins, Ph.D. (Ind. U.). British romanticism, Appalachian literature.
W. Michael Grant, Ph.D. (Brown U.). Medieval literature.
Martha C. Howard, M.A. (U. Mich.)—*Director, University Honors Program.* Dialectology, Linguistics.
Russell C. MacDonald, Ph.D. (U. Penn). Restoration and 18th century literature, Prose fiction, Creative writing.
Thomas Miles, Ph.D. (SUNY). Medieval literature, Professional writing.
Byron C. Nelson, Ph.D. (U. Wisc.). Radicals in the English Revolution, Music and literature, Shakespeare/Elizabethan/Modern drama.
Frank Scafella, Jr., Ph.D. (U. Chicago). American literature, Literature and religion, Ernest Hemingway.
Myron C. Tuman, Ph.D. (Tulane U.). Rhetoric, Basic writing.
Barry Ward, Ph.D. (Ohio St. U.). Folklore, Medieval literature, American studies.
Hayden Ward, Ph.D. (Columbia U.). Victorian studies, Journal editing, 19th century American literature.

Assistant Professors

Timothy Adams, Ph.D. (Emory U.). American literature, American studies, Autobiography.
Dennis Allen, Ph.D. (U. Minn.). Critical theory, Prose fiction.
Joy U. Berkley, M.A. (WVU). American literature.
Edna M. Dillon, M.A. (WVU). Writing process.
Nicholas G. Ehle, Jr., M.A. (WVU). American literature.
Nicholas G. Evans, Ed.D. (WVU). Composition and language, British literature, Higher education law.
John Flynn, D.A. (Carnegie-Mellon U.). Creative writing, Poetry.
Winston Fuller, M.A. (U. Colo.). Poetics.
Jack W. Futrell, M.A. (Columbia U.). Modern literature.
Carolyn H. Hampson, M.A. (WVU). American literature, Popular culture.
Ellesa Clay High, Ph.D. (Ohio U.). Appalachian literature, Creative writing.
Betty Jo Hypes, M.A. (WVU). American literature.
Iris M. Jennings, M.A. (WVU). American literature, Business writing.
Terry Lucas, M.A. (WVU). Short fiction, Composition.
Elizabeth Madison, Ph.D. (Ind. U.). Comparative literature, Modern fiction.

Margaret Racin, M.A. (WVU). English education, Feminist criticism, Composition.
Kathleen G. Rousseau, M.A. (WVU). American Nobel Laureates, The Brontes, Emily Dickinson.
Dorothy Sedley, M.A. (Sonoma St. C.). Linguistics, Grammar, Technical writing.
Aileen K. Shafer, M.A. (WVU). American literature, Business writing.
Anna W. Shannon, Ph.D. (U. Nebr.). Southern literature, Black fiction, Women's studies.
Cheryl Torsney, Ph.D. (U. Fla.). American literature, Women's studies, Critical theory.

Nature of Program

A student majoring in English begins with a basic knowledge of American and British literary history (Engl. 21, 22, 24, and 25) and at least one course in the formal study of language (English 111, 113, 210, or 211). In addition, a course in Shakespeare is required (either English 150 or 250). Beyond these 6 required courses, the student selects—usually at the 100 and 200 level—at least 15 additional hours of course work in the Department of English to match his or her interests and career objectives.

The department offers a wide range of courses for students who intend to: (1) pursue a graduate degree in English; (2) attain certification for teaching English or Language Arts (comprehensive) in the secondary schools; (3) concentrate in literature and language as preparation for entrance into professional schools such as law, medicine, or dentistry; (4) concentrate in writing.

Because students have varied interests in studying literature, language, and/or writing, they are strongly urged to consult with the department's undergraduate adviser in planning their selection of course work. To aid students in their deliberations, the department has prepared a statement explaining special features of its curriculum (e.g., field experience, teaching practicum), informing students of the opportunity to double major, and suggesting course selections for students interested in, among other things: literary history; genre studies; language studies; creative writing; scientific/technical writing; Appalachian studies; women's studies; and graduate study in English.

Admissions Requirements

Admission to the degree program may be sought upon the completion of 58 hours with a 2.0 grade-point average and also requires at least a cumulative average of 2.0 for courses in English. Students must maintain at least a 2.0 cumulative average for English courses at WVU in order to retain status as an English major.

Degree Requirements

An English major must complete a minimum of 33 hours in literature, language, and writing, exclusive of English 1 and 2. A major may have a maximum of 42 hours in English, exclusive of English 1 and 2, within the 128 hours required for graduation.

Required courses include English 21, 22, 24, and 25. One course from the following: English 111, 113, 210, 211. Also English 150 or 250. At least 15 additional hours of courses offered by the Department of English in literature, language, or writing. At least 9 hours of the student's total course work must be at the 200 level.

Publications

The Department of English edits *Victorian Poetry*, the critical journal of Victorian literature established by WVU in 1963, which has become the internationally recognized scholarly journal in its field with subscribers in all 50 states and in 26 foreign countries.

The West Virginia University Literary Review, a publication of WVU student writing, is also sponsored by the Department of English and the English Honorary and Club.

Archives of British History and Culture also is supported by the Department of English.

West Virginia Philological Papers, a publication dedicated to literary scholarship within the state, is co-sponsored by the Department of English.

Courses of Instruction in English Language and Literature (Engl.)

Courses in Writing: Engl. 1, 2, 8, 101, 102, 103, 104, 105, 106, 108, 201, 202, 208, 293, 295/391.

Courses in Language Studies: Engl. 111, 112, 113, 210, 211.

Courses in Literature: Engl. 21, 22, 24, 25, 30, 35, 36, 40, 45, 80, 85, 125, 130, 131, 132, 133, 134, 141, 143, 145, 150, 170, 171, 172, 175, 178, 180, 181, 183, 186, 188, 220, 223, 232, 235, 236, 240, 241, 245, 250, 255, 256, 261, 262, 263, 264, 265, 266, 267, 268, 280, 283, 288, 294, 310, 311, 330, 331, 332, 334, 335, 336, 337, 340, 341, 345, 350, 356, 365, 366, 369, 370, 371, 372, 383.

Special Offerings: Engl. 190, 191, 195, 197, 290, 392.

Lower Division

1. *Composition and Rhetoric.* I, II, S. 3 hr. Writing coherent paragraphs and expository essays in a clear and direct style without errors in usage and punctuation. Required of all bachelor's degree candidates unless the requirement is waived under regulations prevailing at the time of admission.

2. *Composition and Rhetoric.* I, II, S. 3 hr. PR: Engl. 1 or equiv. Writing college-level research papers based on argumentative models. Precision in footnotes, bibliographies, usage, punctuation, and stylistics assumed. Required of all bachelor's degree candidates unless the requirement is waived under regulations prevailing at the time of admission.

8. *Intermediate Composition.* I, II. 3 hr. PR: Engl. 1 and 2. Composition for students who wish to develop skills in solving problems of written communication relevant to their career objectives.

21. *British Literature.* I, II, S. 3 hr. A historical introduction and survey from the middle ages through the eighteenth century.

22. *British Literature.* I, II, S. 3 hr. A historical introduction and survey from the late eighteenth century to the present.

24. *American Literature.* I, II, S. 3 hr. A historical introduction and survey from its beginnings to the mid-nineteenth century.

25. *American Literature.* I, II, S. 3 hr. A historical introduction and survey from the mid-nineteenth century to the present.

30. *Themes and Topics in Literature.* I, II, S. 3 hr. Introduction to literature for non-majors. Themes vary, e.g., Faces of Evil, Nature and Literature, Youth and Maturity. All sections are appropriate for non-majors. *(Not acceptable toward any departmental requirements for English majors.)*

35. *Poetry and Drama.* I, II, S. 3 hr. An introduction to the genres.

36. *Short Story and Novel.* I, II, S. 3 hr. An introduction to the genres.

40. *Introduction to Folklore.* I, II, S. 3 hr. Recognition, collection, and documentation of folklore materials.

45. *Appalachian Experience in Literature.* I, II, S. 3 hr. An introduction to the imaginative literature of the region.

80. *Literature of Black America.* I, II, S. 3 hr. A historical introduction and survey from its beginnings to the present.

85. *Contemporary African Literature.* I, II, S. 3 hr. A survey of contemporary African poetry, drama, and fiction.

Upper Division

101. *Creative Writing: Narration (Short Story).* I, II. 3 hr. Purpose and pattern of the modern short story; study of examples in the current periodicals; special assignments and conferences with individual students on a minimum number of short stories.

102. *Creative Writing: Fiction.* I, II. 3 hr. Workshop course for students to explore further their interests in writing fiction. Emphasis on studying the craft and analyzing the student's own work.

103. *Creative Writing: Poetry.* I, II. 3 hr. Practice in basic techniques of writing poetry. Possibilities and limitations of the poetic genre. Primary emphasis on image, metaphor, and development by association.

104. *Creative Writing: Poetic Forms.* I, II. 3 hr. Practice in the basic techniques of writing open and closed forms of poetry. Primary emphasis on rhythm, sound, tone, and voice.

105. *Business English.* I, II, S. 3 hr. PR: Engl. 1 and 2. *(Typing may be required.)* Assembling economic and commerical data, and writing business correspondence and reports; covers content, organization, style and conventions of grammar and usage.

106. *Journal Writing.* I, II. 3 hr. PR: Engl. 1 and 2 or equiv. Practice in writing a sequence of structured exercises designed to enhance creativity and awareness. Students also study the theories on which these exercises are based and apply them to the autobiographical writings of others.

108. *Advanced Composition.* I, II. 3 hr. PR: Engl. 1 and 2. Composition for students who wish to further develop their expository and argumentative writing skills.

111. *The English Language.* I, II, S. 3 hr. Study of the structure of contemporary English and how it works: the sound system and word-formation and sentence-formation systems and how they interact to create meaning.

112. *Words and Usage.* I, II. 3 hr. Practical vocabulary building, English grammar and usage. Attention to the derivation, history, and meaning of words, and to the principles of syntax and grammar.

113. *American English.* I, II. 3 hr. Historical survey of the development of American English from the time of colonization to the present. Attention to social, cultural, economic, and political forces that have influenced the development of American English. Emphasis on the Appalachian dialect.

125. *World Literature.* I, II. 3 hr. Selected readings in the works of authors of world literature both ancient and modern.

130. *Biography and Autobiography.* I, II. 3 hr. Biography and autobiography as a genre; representative works chosen for their literary value and their interest and relevance in contemporary life; figures in the arts, sciences, business, and public life.

131. *American Fiction.* I, II. 3 hr. Reading of short stories and novels by American authors of the nineteenth and twentieth centuries.

132. *Poetry.* I, II. 3 hr. Appreciation and enjoyment of poems through critical and analytical reading. Studies in the various types of poetry, and of the language, imagery, and techniques of poetic expression.

133. *The Short Story.* I, II. 3 hr. The short story's structure, history, and contemporary forms.

134. *Modern Drama.* I, II. 3 hr. World drama from Ibsen to the present.

141. *American Folklore and Culture.* I, II, S. 3 hr. PR: Engl. 40 or consent. Various aspects of folklore from the American Indian, early settlers, the American Negro, the immigrant, and occupational groups. Influence of folklore on American culture.

143. *Modern Continental Novel.* I, II. 3 hr. Discussion and analysis of continental novels of the twentieth century.

145. *Appalachian Fiction.* I, II, S. 3 hr. Reading of short stories, novels, and other narratives by Appalachian authors.

150. *Shakespeare.* I, II. 3 hr. Twelve of Shakespeare's most important plays.

170. *Modern Literature.* I. 3 hr. British and American poetry, drama, and fiction of the period from 1900 to 1930.

171. *Modern Literature.* II. 3 hr. Continuation of Engl. 170 from approximately 1930 to 1960.

172. *Contemporary Literature.* I, II, S. 3 hr. An examination of the significant literature written since 1960 in England and America. Poetry, drama, and fiction. Selections will vary depending on the instructor.

175. *Science Fiction and Fantasy.* I, II, S. 3 hr. A study of the history and nature of science fiction from H. G. Wells to the present, with special attention to those features of prose narration that science fiction shares with fantasy.

178. *Popular American Culture.* I. 3 hr. A survey of modern popular American culture from 1940 to the present with special emphasis on popular literature, music, television, movies, radio in its golden age, and comic books.

180. *Literature of the Old Testament.* I, II. 3 hr. Various types of literature exemplified in the Old Testament, read for their intrinsic merit and for their historical and cultural significance. Continued in Engl. 181.

181. *Literature of the New Testament.* I, II. 3 hr. Contents of the Old Testament Apocrypha and New Testament, their literary quality, with consideration of historical relations and of relationships of the several writers represented.

183. *Study of Selected Authors.* I, II, S. 3 hr. *(May be repeated with a change in course content for a maximum of 9 credit hours.)* Study of the works of one or more major authors.

186. *Black American Fiction.* I, II. 3 hr. Reading of novels and short stories by black American authors from 1890 to the present.

188. *Images of Women in Literature.* I, II. 3 hr. Representative literary works studied against backdrop of social and historical documents to examine effect of images of women in literature on self-image of women today.

190. *Teaching Practicum.* I, II, S. 1-3 hr. Teaching practice as a tutor or assistant in composition, literature, or business English.

191. *Special Topics.* I, II, S. 1-3 hr. PR: Consent. Investigation of topics not covered in regularly scheduled courses.

194. *Professional Field Experience.* I, II, S. 1-12 hr. PR: Consent. Prearranged experimental learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development. *(Pass/Fail grading.)*

195. *Seminar.* I, II, S. 1-3 hr. PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

197. *Honors.* I, II, S. 1-3 hr. PR: Consent. Independent reading, study or research.

201. *Creating Writing Workshop: Fiction.* I, II. 3 hr. Advanced workshop in creative writing for students seriously engaged in writing fiction.

202. *Creative Writing Workshop: Poetry.* I, II. 3 hr. Advanced workshop in creative writing for students seriously engaged in the writing of a major group of poems.

208. *Scientific and Technical Writing.* I, II. 3 hr. PR: Engl. 1 and 2. Writing for scientific and technical professions. Descriptions of equipment and processes; reports and proposals; scientific experiments; interoffice communications; articles for trade and research journals.

210. *Structure of the English Language.* I, II. 3 hr. Historical, comparative, and descriptive grammar, together with an introduction to English linguistics.

211. *History of the English Language.* I, II. 3 hr. Study of the nature of the language; questions of origins, language families, development, relationships of English as one of the Indo-European languages.

220. *American Poetry.* I, II. 3 hr. Major American poets of the nineteenth and twentieth centuries.

223. *Modern American Poetics.* I, II. 3 hr. A close study of those poets who have shaped the aesthetics of contemporary American poetry. *(Course will not be offered in 1986-87.)*

232. *Literary Criticism.* I, II. 3 hr. Literary criticism from Aristotle to modern times.

235. *American Drama.* I, II. 3 hr. Representative American dramas and history of theatre in America.

236. *Tragedy.* I, II. 3 hr. Masterpieces of tragedy from Greek times to modern, with consideration of changing concepts of tragedy and of ethical and ideological values reflected in works of major tragic authors. *(Course will not be offered in 1986-87.)*

240. *Folk Literature.* I, II. 3 hr. The folk ballad, its origin, history, and literary significance, based on Child's collection and on American ballad collections.

241. *Folk Literature of the Southern Appalachian Region.* I, II. 3 hr. Traditional literature of the southern Appalachian region, including songs, prose, tales, languages, customs, based on material collected in the region—especially in West Virginia.

245. *Studies in Appalachian Literature.* I, II, S. 3 hr. Studies of authors, genres, themes, or topics in Appalachian literature.

250. *Shakespeare's Art.* I, II, S. (Alternate Years.) 3 hr. Special studies in Shakespeare's tragedies, comedies, and/or history plays, with some attention given to his non-dramatic poetry. With emphases varying from year to year, studies may include textual, historical, critical, and dramaturgical-theatrical approaches.

255. *Chaucer.* I, II. 3 hr. Early poems, *Troilus and Criseyde,* and *The Canterbury Tales.* In addition to an understanding and appreciation of Chaucer's works, the student is expected to acquire an adequate knowledge of Chaucer's language.

256. *Milton.* I, II. 3 hr. All of Milton's poems and a few selected prose works. *(Course will not be offered in 1986-87.)*

261. *Sixteenth Century Prose and Poetry.* I, II. 3 hr. Studies from Caxton to Bacon, from Skelton to Shakespeare. *(Course will not be offered in 1986-87.)*

262. *Seventeenth Century Prose and Poetry.* I, II. 3 hr. Studies from Donne to Dryden.

263. *Literature of the Eighteenth Century.* I, II. 3 hr. Literature of the period 1660-1744 in relation to social, political, and religious movements of the time.

264. *Literature of the Eighteenth Century.* I, II. 3 hr. Continuation of Engl. 263, covering the latter half of the century. May be taken independently of Engl. 263. *(Course will not be offered in 1986-87.)*

265. *The Romantic Movement.* I, II. 3 hr. A survey of the works of the major British Romantic writers along with an introduction to works of scholarship in British Romanticism.

266. *American Romanticism.* I, II. 3 hr. Writings of Ralph Waldo Emerson, Henry David Thoreau, and Nathaniel Hawthorne. A study of relations of these men to the history of their own time; their contributions to American thought and art. *(Course will not be offered in 1986-87.)*

267. *Victorian Poetry.* I, II. 3 hr. Major Victorian poets—Tennyson, Browning, Arnold, Rossetti, Morris, Swinburne, Fitzgerald—and a few of the later Victorian poets. *(Course will not be offered in 1986-87.)*

268. *Modern British Poetry.* I, II. 3 hr. British poetry from 1880 to present, including the Decadents, Counter-Decadents, Hopkins, Housman, Hardy, the Georgians, the Imagists, World War I poets, Yeats, Eliot, the Auden Group, and post-World War II poets.

280. *Southern Writers.* I, II. 3 hr. Twentieth-century Southern essayists, poets, short-story writers, and novelists in relation to ideological background.

283. *Study of Selected Authors.* I, II. 3 hr. *(May be repeated with a change in course content for a maximum of 9 credit hours.)* Study of the works of one or more major authors.

288. *Women Writers in England and America.* I, II. 3 hr. Syllabus may vary from year to year to include women writers in a particular country, historical period, or genre; or writing on a particular theme.

290. *Independent Study.* I, II. 1-3 hr. *(With departmental consent, may be repeated for a maximum of 9 credit hours.)* PR: Departmental consent. Individual study of literary, linguistic, and writing problems.

293. *Practicum in Teaching Composition.* I. 1 hr. PR: Engl. 108, 295. Designed to give prospective English and language arts teachers supervised practical experiences in individual writing tutorials.

294. *Fiction for Adolescents.* II. 3 hr. Designed for prospective teachers of English and language arts. Course focuses on recent fiction for adolescents as well as on traditional literature appropriate to the needs, interests, and abilities of youth. Evaluative criteria emphasized.

295/391. *Approaches to Teaching Composition.* I. 3 hr. *(May not be taken for both undergraduate and graduate credit.)* Surveys attitudes toward and techniques of teaching writing in elementary and secondary schools. Provides frequent opportunities for students to write, to analyze their writing, and to experiment in class with methods of teaching writing.

310. *Old English 1.* I, II. 3 hr. Study of Anglo-Saxon with selected readings from the literature of the period. *(Course will not be offered in 1986-87.)*

311. *Old English 2.* I, II. 3 hr. PR: Engl. 310, *Beowulf* and other texts in Old English. *(Course will not be offered in 1986-87.)*

330. *Early English Drama.* I, II. 3 hr. Study of the medieval and early Tudor drama to the age of Shakespeare.

331. *Elizabethan Drama.* I, II. 3 hr. Study of dramas of Shakespeare's contemporaries and successors to the closing of the theatres in 1642. Includes Kyd, Marlowe, Jonson, Heywood, Chapman, Webster, Beaumont, and Fletcher.

332. *Restoration and Eighteenth Century Drama.* I, II. 3 hr. Comedy, tragedy, the heroic play, the drama of sensibility and the reaction against it: Etherege, Wycherley, Farquhar, Congreve, Vanbrugh, Dryden, Otway, Goldsmith, and Sheridan.

334. *Contemporary Drama.* I, II. 3 hr. Recent developments in the drama, with special attention to Miller, Williams, Sartre, Anouilh, Osborne, Pinter, Bolt, and the Absurdists. *(Content altered as new playwrights representing new developments come into prominence.) (Course will not be offered in 1986-87.)*

335. *The English Novel to the Time of Scott.* I, II. 3 hr. Study of the English novel from the sixteenth century to the time of Scott, showing the development of the novelistic art from early narrative beginnings.

336. *The English Novel, 1832-1900.* I, II. 3 hr. Continuation of Engl. 335. Development of the English novel from the early nineteenth century to the beginning of the twentieth century.

337. *The Modern Novel.* I, II. 3 hr. Twentieth-century novel, with emphasis on works of selected British novelists.

340. *The American Novel to 1915, 1.* I, II. 3 hr. History of the American novel, based on reading of ten to twelve novels, from the beginning to World War I.

341. *The American Novel, 2.* I, II. 3 hr. History of the American novel, based on readings of ten to twelve novels from World War I to the present. *(Course will not be offered in 1986-87.)*

345. *Appalachian Literature.* I, II, S. 3 hr. Intensive study of selected topics, works, and writers of Appalachia.

350. *Shakespeare.* I, II. 3 hr. Intensive study of selected plays. Special attention to textual problems and to language and poetic imagery, together with the history of Shakespearean criticism and scholarship.

356. *Romantic Poetry.* I, II. 3 hr. Reading and study of the works of selected poets of the British Romantic movement with emphasis on related criticism and scholarship.

365. *Victorian Prose.* I, II. 3 hr. Study of the nonfictional writings of the great Victorian prose critics: Carlyle, Ruskin, Arnold, Newman, Macaulay, Huxley, and Morris. *(Course will not be offered in 1986-87.)*

366. *English Literature, 1880-1918.* I, II. 3 hr. Study of the more important writers and literary movements of the late Victorian and the Edwardian periods; emphasis on Hardy, Housman, Hopkins, Henley, Pater, Gissing, Moore, Butler, and writers of the "Aesthetic Movement." *(Course will not be offered in 1986-87.)*

369. *American Literature to 1830.* I, II. 3 hr. The major genres and themes of American literature in the colonial and early national periods (1620-1830) with special attention to the cultural context of the literature.

370. *American Literature, 1830-1865.* I, II. 3 hr. The Romantic period in American literature, concentrating on Emerson, Thoreau, Poe, Hawthorne, and Melville. *(Course will not be offered in 1986-87.)*

371. *American Literature, 1865-1915.* I, II. 3 hr. The literature of transcendentalism, realism, and naturalism in America between the Civil War and World War I, concentrating on Whitman, Twain, James, Dickinson, Crane, Adams, and Dreiser.

372. *American Literature, 1915-Present.* I, II. 3 hr. American prose and poetry.

383. *Recent Literary Criticism.* I, II. 3 hr. Brief survey of theories of major schools of modern criticism and an application of these theories to selected literary works.

391 / 295. *Approaches to Teaching Composition.* I. 3 hr. *(May not be taken for both undergraduate and graduate credit.)* Surveys attitudes toward and techniques of teaching writing in elementary and secondary schools. Provides frequent opportunities for students to write, to analyze their writing, and to experiment in class with methods of teaching writing.

392. *Special Topics.* I, II, S. 1-9 hr. PR: Consent. Advanced study of special topics in language, literature, or writing.

Foreign Languages

Degrees Conferred: B.A., M.A.
Contact:
Robert J. Elkins, *Chairperson*, 293-5121
Harley U. Taylor, *Associate Chairperson*, 293-5121
Department is in 205 Chitwood Hall.

Faculty

Professors

Laszlo A. Borsay, Ph.D. (U. Pitt)—Classics. *Emeritus.*
Robert J. Elkins, Ph.D. (U. Kans.)—*Chair.* German. Language methodology, German radio plays, English as a second language.
Francisco Herrera, M.A. (WVU)—Spanish. *Emeritus.*
Victor J. Lemke, Ph.D. (U. Wisc.)—German. *Emeritus.*
Joseph A. Murphy, Ph.D. (Ohio St. U.)—French. English as a second language, Foreign language education.
Jean-Pierre M. Ponchie, Ph.D. (Mich. St. U.)—French. Contemporary French civilization, 17th and 18th century French literature.
Joseph J. Prentiss, Ph.D. (U. Pitt)—Classics. Greek and Latin literature, Classical mythology.
William L. Siemens, Ph.D. (U. Kans.)—Spanish. Spanish-American literature, Picaresque novel.
Armand E. Singer, Ph.D. (Duke U.)—Spanish. *Emeritus.*
Robert Stilwell, Ph.D. (U. Tex.)—German. *Emeritus.*
Harley U. Taylor, Jr., Ph.D. (Ind. U.)—*Associate Chair.* German. Scientific German, Modern German literature.

Associate Professors

Michel J. Beauchemin, M.A. (Brown U.)—French. 17th century French literature.
Marilyn Bendena, Ph.D. (Wayne St. U.)—French, Russian. Russian literature/culture, Contemporary French novel.
Axel Claesges, Ph.D. (Vanderbilt U.)—German. German cultural and intellectual history, 19th century German literature, Commercial German.
Ronald W. Dunbar, Ph.D. (U. Wisc.)—German, Linguistics. German linguistics, English as a second language.
Eleanor R. Gibbard, M.A. (WVU)—French. *Emerita.*
Pablo Gonzalez, Ph.D. (U. Madrid)—Spanish. Spanish-American literature, Commercial Spanish.
Gary L. Harris, Ph.D. (Ohio St. U.)—Russian, Linguistics. Computational linguistics, Slavic linguistics.

Luis Harss, M.A. (Stanford U.)—Spanish. Catalan language and literature, Spanish literature and culture.

Joseph F. Renahan, M.S. (Yeshiva U.)—Spanish. French and Spanish philology, Spanish Golden Age drama.

Jurgen Schlunk, Ph.D. (U. Marburg)—German. 18th century German literature, 19th and 20th century German drama.

Janice Spleth, Ph.D. (Rice U.)—French. Franchophone literature and culture, 19th century French drama.

M. Stanley Whitley, Ph.D. (Cornell U.)—Linguistics, Spanish. Sociolinguistics, Phonology, History of linguistics.

Assistant Professors

Sandra Dixon, M.A. (U. Penn)—Spanish. Portuguese literature, Spanish-American literature.

Christine Clark-Evans, M.A. (Bryn Mawr C.)—French. 18th century French literature.

John R. Goldberg, Ph.D. (U. Kans.)—Linguistics, French. English as a second language, Friulian, Romance linguistics.

Lois Hinckley, Ph.D. (U. N.C.)—Classics. Roman literature/civilization, Greek literature/civilization.

Donald T. Huffman, M.A. (Ind. U.)—German. English as a second language, Computer assisted instruction.

Michael E. Reider, Ph.D. (U. Iowa)—Spanish, Linguistics. Syntax and phonology, Psycholinguistics.

Lecturer

Takeko Ruf, A.B. (Kinjo Wom. C.)—Japanese. Japanese teaching methodology, Japanese culture.

Nature of Program

The Department of Foreign Languages offers work in foreign languages, literatures, cultures, and in linguistics. Languages regularly taught include Chinese, French, German, Greek, Italian, Japanese, Latin, Russian, and Spanish. (Languages in the program which will likely not be taught in the 1986-87 academic year include Arabic, Hausa, Hebrew, Polish, Portuguese, and Swahili.) Certain literature courses are taught in English and are designated as FLIT (Foreign Literature in Translation) courses. Other areas of instruction are EFL (English As a Foreign Language), Linguistics, Language Teaching Methods, and Bibliography and Research.

A student may be a candidate for a B.A. degree with options in French, German, Russian, Spanish, Classics, Linguistics, Foreign Literature in Translation, and Teaching English As a Foreign Language. Depending on the choice of degree option and elective courses, the B.A. in foreign languages may be used as undergraduate preparation for advanced study or for careers in teaching or government service.

The Department of Foreign Languages regularly offers language courses abroad. Courses in German have been offered in Germany and Austria during the summer, in Spanish in Spain and Colombia during the summer, and in France during the fall, spring, and summer. Students participating in a summer program normally register for 6 semester hours of credit at WVU, but the work is conducted overseas. Those students participating in a fall or spring semester abroad enroll for 15-28 credit hours of credit.

Contingent upon funding and faculty availability, the Department of Foreign Languages will offer a spring semester in France in 1986-87, and plans to offer a summer session in Austria as well as in Spain or Colombia.

The following points of information are listed for the benefit of all students who wish to enroll in courses offered by the Department of Foreign Languages:

1. The basic series of foreign language courses is divided into three levels: elementary, intermediate, and advanced. The elementary level, courses 1 and 2, provides beginning work in the four basic skills of the languages: understanding, speaking, reading, and writing, with emphasis on audio-lingual procedures. The vocabulary employed is limited to words of high frequency. Intermediate level, courses 3 and 4, provides further training in the four basic skills, with greater emphasis on reading. The vocabulary is greatly extended, especially the passive or recognition vocabulary. In courses 103, 104, 109, 110, the four basic skills are further developed. All classroom questions and discussions are in the foreign language. The work is based on reading assignments followed by classroom discussions, oral drills, and written exercises.

2. In French, German, and Spanish, alternate routes are offered at the intermediate level whenever possible. Courses numbered 23 and 24 provide two semesters of work intended to develop a thorough reading knowledge. In them little attention is given to pronunciation and none at all to other aspects of the oral skills.

Courses numbered 33 and 34 are taught in the target language. The major difference between them and those numbered 3 and 4 is in the choice of materials. Courses 3 and 4 use literary materials as a basis for discussion whereas courses 33 and 34 use cultural materials. Students who elect courses 33 and 34 may then continue in the normal 103-110 sequence.

Students can receive credit for only one of the courses 1 or 21; 2 or 22; 3, 23, or 33; 4, 24, or 34 in the same language.

3. Courses numbered 10 are intensive and are the equivalent of courses 1 and 2. Students may receive credit for either course 1 and 2 or 10 but not for both. Courses numbered 11 are the intensive equivalent of courses 3 and 4. Students may receive credit for courses 3 and 4 or 11 but not both.

4. Students who present two or more units of high school credit in a foreign may satisfy the foreign language requirement of the College of Arts and Sciences by taking courses 3 and 4, or other approved courses on the same or higher level, in that language.

5. The Department of Foreign Languages offers a credit by examination testing program for elementary and intermediate classes in Classics, French, German, Italian, Russian, and Spanish only. Information about the program is available in 205-A Chitwood Hall.

Admission Requirements

Admission to the degree program of the Department of Foreign Languages may be requested upon the completion of 58 credit hours with an overall 2.0 grade-point average. A student admitted to the degree program will choose one of the departmental degree options and then be assigned to a faculty adviser who will direct the student's completion of the degree requirements for that option.

Degree Requirements

A foreign language major must complete a minimum of 27 hours of upper-division work offered by the Department of Foreign Languages. Three of the hours must be Linguistics 111. Lang. 221 can not be counted toward the major. Twelve of the hours must be in one of the options listed in the following section under the heading "Options."

All students majoring in foreign languages must present a minor consisting of 12 upper-division hours from within the department or from

outside the department. An outside minor must be approved by the adviser. The departmental minor may not duplicate courses from the major. All 12 hours in the minor must have the same division prefix [i.e., German, Spanish, Linguistics, FLIT, etc.].

Students wishing teacher certification should inquire as to which courses fulfill certification requirements.

In addition to the courses required for the Foreign Language major, students should elect relevant elective courses in history, political science, humanities, English, journalism, geography, sociology and anthropology, and/or business and economics. Students electing the joint Foreign Language/Economics program should make the information available to the Chairperson of Foreign Languages at the earliest opportunity in order to enroll in the proper Economics courses.

The Department of Foreign Languages cooperates closely with several other departments in offering interdepartmental majors.

Students with majors other than Foreign Languages who have an interest in learning about the possibility of getting a second major in Foreign Languages are invited to request information from the Chairperson of the Department of Foreign Languages.

Options

In addition to fulfilling the degree requirements already listed, a foreign language major must select one of the following degree options and complete the four courses listed for that option as part of the 27-hour, upper-division requirement:

French: French 103, 104, 109, 110.

German: German 103, 104, 109, 110.

Spanish: Spanish 103, 104, 109, 110.

Russian: Russian 103, 104, 109, 110.

Classics: Classics 109, 110, and two upper-division classics courses approved by the adviser.

Linguistics: Ling. 202, 283, 284, plus one upper-division linguistics course approved by the adviser.

FLIT: Four upper-division FLIT courses approved by the adviser.

EFL: Four language and linguistic courses in EFL.

Students electing the French, German, Spanish, Russian, Classics, and Linguistics options may not use FLIT courses to fulfill the major requirements but may use them for the minor requirement.

Courses of Instruction in Arabic (Arab.)

Lower Division

1. *Elementary Modern Standard Arabic.* I. 3 hr. Elementary modern standard Arabic. *(Course will not be offered in 1986-87.)*
2. *Elementary Modern Standard Arabic.* II. 3 hr. PR: Arab. 1. Continuation of Arab. 1. *(Course will not be offered in 1986-87.)*
3. *Intermediate Modern Standard Arabic.* I. 3 hr. PR: Arab. 1, 2 or equiv. Continuation of Arab. 2. *(Course will not be offered in 1986-87.)*
4. *Intermediate Modern Standard Arabic.* II. 3 hr. PR: Arab. 3 or consent. Continuation of Arab. 3. *(Course will not be offered in 1986-87.)*

Courses of Instruction in Chinese (Chin.)

Lower Division

1. *Elementary Chinese.* I. 3 hr.
2. *Elementary Chinese.* II. 3 hr. Continuation of Chin. 1.
3. *Intermediate Chinese.* I. 3 hr. PR: Chin. 1, 2 or equiv.
4. *Intermediate Chinese.* II. 3 hr. PR: Chin. 3 or equiv.

Upper Division

191. *Special Topics.* I, II. 1-4 hr.* PR: Consent.

Courses of Instruction in Classics (Class.)

Lower Division

1. *Elementary Latin.* I. 3 hr.
2. *Elementary Latin.* II. 3 hr.
3. *Intermediate Latin.* I. 3 hr. PR: Class. 1 and 2, or two years of high school Latin.
4. *Cicero's Orations.* II. 3 hr. PR: Class. 3, or two years of high school Latin.
11. *Elementary Greek.* I. 3 hr.
12. *Elementary Greek.* II. 3 hr.
13. *Intermediate Greek.* I. 3 hr. PR: Class. 12.
14. *Intermediate Greek.* II. 3 hr. PR: Class. 13.

Upper Division

101. *Greek and Roman Civilization and Culture.* I. 3 hr.
102. *Greek and Roman Myths.* II. 3 hr.
109. *Selections from Roman Prose.* I. 3 hr. PR: Class. 3 and 4 or consent.
110. *Selections from Roman Poetry.* II. 3 hr. PR: Class. 4 and 109 or consent.
113. *Roman Biographers.* I. 3 hr. PR: Class. 3 and 4 or consent. *(Course will not be offered in 1986-87.)*
165. *Roman Public and Private Life.* II. 3 hr. *(Course will not be offered in 1986-87.)*
192. *Special Topics.* I, II. 3 hr. PR: Consent.
195. *Field Experience.* I, II, S. 1-18 hr.* PR: Consent.
201. *Roman Novelists.* I. (Alternate Years.) 3 hr. PR: Class. 109, 110, or consent.
202. *Roman Comedy.* II. (Alternate Years.) 3 hr. PR: Class. 109, 110, or consent.
235. *Roman Epic.* I. 3 hr. PR: Class. 109, 110, or equiv.
292. *Pro-Seminar in Latin or Greek Literature.* 1-6 hr.* PR: Consent. Special topics.

*Variable credit courses normally carry 3 hours credit. Exceptions are made only in emergencies and must be approved by the Department Chairperson and the professor teaching the course.

Courses of Instruction in English As a Foreign Language (EFL)

Lower Division

51. *Intermediate Conversational English.* I, II, S. 3 hr. This course will emphasize colloquial and idiomatic English expression, concentrating on listening comprehension and communicative skills. Does not satisfy the Engl. 1 and 2 requirement. *(Does not qualify for Core.)*

52. *Advanced Conversational English.* I, II, S. 3 hr. PR: EFL 51 or consent. Continuation of EFL 51. Does not satisfy the Engl. 1 and 2 requirement. *(Does not qualify for Core.)*

53. *English Grammar and Composition.* I, II, S. 3 hr. For foreign students only. Review of basic principles of English grammar, introduction to reading techniques, introduction to principles of composition. Vocabulary, punctuation, and spelling. *(Does not satisfy the Engl. 1 and 2 requirement.) (Does not qualify for Core.)*

54. *Intermediate English Grammar and Composition.* I, II, S. 3 hr. PR: EFL 53 or consent. Continuation of EFL 53. For foreign students only. Does not satisfy the Engl. 1 and 2 requirement. *(Does not qualify for Core.)*

55. *Advanced English Grammar and Composition.* I, II, S. 3 hr. PR: Consent. For foreign students only. An introduction to the specific skills and vocabulary needed to communicate effectively in the student's chosen specialization. Focuses on problems peculiar to foreign students in their areas of study. *(Does not satisfy the Engl. 1 and 2 requirement.) (Does not qualify for Core.)*

Upper Division

191. *Special Topics.* I, II, S. 1-4 hr.* PR: Consent.

195. *Field Experience.* I, II, S. 1-18 hr.* PR: Consent.

Courses of Instruction in Foreign Literature in Translation (FLIT)

Lower Division

13. *Introduction to French Literature.* II. (Alternate Years.) 3 hr. Major writers and representative movements in French literature from its beginning to the present.

14. *Introduction to German Literature.* I. (Alternate Years.) 3 hr. Survey of German literature with selected readings of prose, poetry, and drama from the Enlightenment to the present.

15. *Introduction to Spanish Literature.* I. (Alternate Years.) 3 hr. Reading and discussion of representative Spanish novels, plays, and epic poetry from the Middle Ages to the twentieth century. Special emphasis on Don Quixote, its roots and its place in the development of Western culture.

16. *Introduction to Latin American Literature.* II. (Alternate Years.) 3 hr. Reading and discussion of representative works of twentieth-century Latin American writers.

17. *Introduction to Russian Literature.* I. (Alternate Years.) 3 hr. Major writers and representative movements in Russian literature from its beginning to the present.

18. *Introduction to Italian Literature.* II. (Alternate Years.) 3 hr. Italian literary masterpieces will be examined in historical perspective and in relation to the European mainstream.

Upper Division

111. *Italian Literature in Translation 1.* I. 3 hr. Selected Italian works from the twelfth century to the end of the eighteenth century. Readings and discussion in English.

*Variable credit courses normally carry 3 hours credit. Exceptions are made only in emergencies and must be approved by the Department Chairperson and the professor teaching the course.

112. *Italian Literature in Translation 2.* II. 3 hr. Selected Italian works from the nineteenth and the twentieth centuries. Readings and discussion in English.

121. *Latin Literature in Translation 1.* I. 3 hr. Survey of Latin literature in translation.

122. *Latin Literature in Translation 2.* II. 3 hr. Survey of Latin literature in translation.

131. *Greek Literature in Translation 1.* I. 3 hr. Survey of Greek literature in translation.

132. *Greek Literature in Translation 2.* II. 3 hr. Survey of Greek literature in translation.

141. *Spanish Literature in Translation 1.* I. 3 hr. Selected Spanish works from the twelfth century to the end of the eighteenth century. Readings and discussion in English.

142. *Spanish Literature in Translation 2.* II. 3 hr. Selected Spanish works from the nineteenth and the twentieth centuries. Readings and discussion in English.

151. *Spanish American Literature in Translation 1.* I. 3 hr. Selected Spanish American works from the sixteenth century to the end of the nineteenth century. Readings and discussion in English.

152. *Spanish American Literature in Translation 2.* II. 3 hr. Selected Spanish American works from the nineteenth and the twentieth centuries. Readings and discussion in English.

155. *Modern Hebrew Literature in Translation.* II. 3 hr. A survey course examining the literature and sociocultural content out of which it grew. From the Yiddish folk background of the ghetto, to the *Haskalah*, to the development of Israeli literature until the present. *(Course will not be offered in 1986-87.)*

161. *French Literature in Translation 1.* I. 3 hr. Selected French works from the Middle Ages to the end of the eighteenth century. Readings and discussion in English.

162. *French Literature in Translation 2.* II. 3 hr. Selected French works from the beginning of the nineteenth century to the present. Readings and discussion in English.

171. *Brazilian Literature in Translation.* II, S. 3 hr. Survey of Brazilian literary masterworks in English translation concentrating heavily on prose forms (novel, novelette, short story, play) dating from the mid-nineteenth century.

181. *German Literature in Translation 1.* I. 3 hr. Selected German works from 800 A.D. to the period of Naturalism. Readings and discussion in English.

182. *German Literature in Translation 2.* II. 3 hr. Selected German works from the period of Naturalism to the present. Readings and discussion in English.

191. *Russian Literature in Translation 1.* I. 3 hr. Major works of Russian authors from the beginning to 1880, including those of Pushkin, Lermontov, Gogol, Turgenev, Dostoyevsky, and Tolstoy. Russian majors will read selections in the original.

192. *Russian Literature in Translation 2.* II. 3 hr. Continuation of FLIT 191. Major literature of Soviet Union from 1880 to the present. Russian majors will read selections in the original.

211. *Chinese Literature in Translation.* I. 3 hr. Survey of selected works of Chinese literature from ancient times through the eighteenth century.

221. *Japanese Literature in Translation.* II. 3 hr. Survey of selected works of Japanese literature from ancient period to the mid-nineteenth century and an introduction to a few works of the modern period.

292. *Pro-Seminar.* I, II, S. 1-6 hr.* PR: 6 hr. upper-division literature courses or consent. Special topics.

391. *Advanced Topics.* I, II, S. 1-6 hr. PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

392. *Seminar.* I, II, S. 1-6 hr.* PR: 6 hr. upper-division literature courses or consent. Special topics.

397. *Master's Degree Research or Thesis.* I, II. 1-15 hr. PR: Consent. Research activities leading to a thesis, problem report, research paper, or equivalent scholarly project.

Courses of Instruction in French (Frch.)

Lower Division

1. *Elementary French.* I, II. 3 hr.

2. *Elementary French.* I, II. 3 hr. Continuation of Frch. 1.

3. *Intermediate French.* I, II. 3 hr. PR: Frch. 1, 2, or equiv.

4. *Intermediate French.* I, II. 3 hr. PR: Frch. 3 or consent. Continuation of Frch. 3.

10. *Intensive Elementary French.* I. 6 hr. The equivalent of Frch. 1 and 2 combined into one course.

11. *Intensive Intermediate French.* II. 6 hr. PR: Frch. 1 and 2 or 10 or consent. The equivalent of Frch. 3 and 4 combined into one course.

21. *Elementary French: Reading.* I. 3 hr. Beginning French with concentration on reading comprehension. *(Course will not be offered in 1986-87.)*

22. *Elementary French: Reading.* II. 3 hr. PR: Frch. 21 or equiv. Continuation of Frch. 21. *(Course will not be offered in 1986-87.)*

23. *Intermediate French: Reading.* I. 3 hr. PR: Frch. 21, 22, or equiv. *(Course will not be offered in 1986-87.)*

24. *Intermediate French: Reading.* II. 3 hr. PR: Frch. 23 or equiv. Continuation of Frch. 23. *(Course will not be offered in 1986-87.)*

33. *Intermediate French: Cultural Emphasis.* I. 3 hr. PR: Frch. 1 and 2, or equiv. *(Course will not be offered in 1986-87.)*

34. *Intermediate French: Cultural Emphasis.* II. 3 hr. PR: Frch. 3, 33, or equiv. Continuation of Frch. 33. *(Course will not be offered in 1986-87.)*

Upper Division

101. *Commercial French.* I. 3 hr. PR: Frch. 4 or equiv. Introduction to the use of the French language in French business practices, letterwriting, and the study of economic geography.

102. *Advanced Commercial French.* II. 3 hr. PR: Frch. 101 or consent. Continuation of Frch. 101; preparation for international examination of Paris Chamber of Commerce.

103. *Advanced French.* I. 3 hr. PR: Frch. 3, 4, consent.

104. *Advanced French.* II. 3 hr. PR: Frch. 103 or consent.

109. *Advanced French.* I. 3 hr. PR: Frch. 104 or consent.

*Variable credit courses normally carry 3 hours credit. Exceptions are made only in emergencies and must be approved by the Department Chairperson and the professor teaching the course.

110. *Advanced French.* II. 3 hr. PR: Frch. 109 or consent.

111. *French Literature from the Middle Ages to the Eighteenth Century.* I. 3 hr. PR: Two years of college French or equiv. or consent.

112. *French Literature from the Eighteenth Century to the Contemporary Period.* II. 3 hr. PR: Two years of college French or equiv. or consent.

115. *The Classical School.* I. 3 hr. PR: 12 hr. of French or equiv.

118. *Literature of the Nineteenth Century.* I. 3 hr. PR: 12 hr. of French or equiv.

191. *Special Topics.* I, II, S. 1-4 hr.* PR: Consent.

203. *Conversational French.* I. 3 hr. PR: Frch. 110 or consent. Intensive spoken French.

217. *French Civilization.* II. 3 hr. PR: 12 hr. of French.

221. *The Romantic Movement.* I. 3 hr. PR: 18 hr. of French or consent.

222. *French Realism.* II. 3 hr. PR: 18 hr. of French or consent.

229. *Literature of the Sixteenth Century.* I. 3 hr. PR: 18 hr. of French or consent.

231. *Phonetics and Pronunciation.* II. 3 hr. PR: 12 hr. of French or equiv.

292. *Pro-Seminar.* I, II, S. 1-6 hr.* PR: 18 hr. of French or consent. Special topics.

305. *Fundamentals for Reading French.* I. 3 hr. PR: Graduate or upper-division standing. *(Frch. 305 and 306 is intended for graduate students from other departments to teach them to read general and technical French.)*

306. *Reading French.* II. 3 hr. PR: 12 hr. of French or equiv. or Frch. 305. *(Graduate students may meet a doctoral foreign language requirement by achieving a grade of B or better in this course.)*

326. *Literary Criticism.* II. 3 hr. PR: B.A. in French or consent.

337. *Moliere.* II. 3 hr. PR: B.A. in French or consent.

344. *Explication de Textes.* II. 3 hr. PR: 24 hr. of French or equiv.

371. *The Modern Novel to 1930.* I. 3 hr. PR: B.A. in French or consent.

372. *The Novel After 1930.* II. 3 hr. PR: B.A. in French or consent.

381. *Medieval French Literature.* II. 3 hr. PR: Lingu. 343.

391. *Advanced Topics.* I, II. 1-6 hr. PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

392. *Seminar.* 1-6 hr.* PR: Consent. Special topics.

397. *Master's Degree Research or Thesis.* I, II. 1-15 hr. PR: Consent. Research activities leading to a thesis, problem report, research paper, or equivalent scholarly project.

Courses of Instruction in German (Ger.)

Lower Division

1. *Elementary German.* I, II. 3 hr.

2. *Elementary German.* I, II. 3 hr.

3. *Intermediate German.* I, II. 3 hr. PR: Ger. 1 and 2, or equiv.

*Variable credit courses normally carry 3 hours credit. Exceptions are made only in emergencies and must be approved by the Department Chairperson and the professor teaching the course.

4. *Intermediate German.* I, II. 3 hr. PR: Ger. 3, or consent. Continuation of Ger. 3.

10. *Intensive Elementary German.* I. 6 hr. The equivalent of Ger. 1 and 2 combined into one course.

11. *Intensive Intermediate German.* II. 6 hr. PR: Ger. 1 and 2 or 10 or consent. The equivalent of Ger. 3 and 4 combined into one course.

23. *Intermediate German: Reading.* I. 3 hr. PR: Ger. 1 and 2, or equiv.

24. *Intermediate German: Reading.* II. 3 hr. PR: Ger. 3, 23, or equiv. Continuation of Ger. 23.

33. *Intermediate German: Cultural Emphasis.* I. 3 hr. PR: Ger. 1 and 2, or equiv.

34. *Intermediate German: Cultural Emphasis.* II. 3 hr. PR: Ger. 3, 33, or equiv. Continuation of Ger. 33.

Upper Division

103. *Advanced German.* I. 3 hr. PR: Ger. 3, 4, or consent.

104. *Advanced German.* II. 3 hr. PR: Ger. 103 or consent.

109. *Advanced German.* I. 3 hr. PR: Ger. 104 or consent. Continuation of the four basic skills.

110. *Advanced German.* II. 3 hr. PR: Ger. 109 or consent.

111. *German Literature to 1832.* I. 3 hr. PR: Ger. 4 or equiv. Readings and discussions of German literature from its earliest beginning until 1832. Representative selections from each major period will be read.

112. *German Literature Since 1832.* II. 3 hr. PR: Ger. 4 or equiv. Readings and discussions of German literature from 1832 to the present time. Representative selections from each major period will be read.

121. *Scientific German.* I. 3 hr. PR: Ger. 1, 2. Primarily for students in science courses.

122. *Scientific German.* II. 3 hr. PR: Continuation of Ger. 121.

131. *German Civilization.* II. 3 hr. PR: Ger. 4 or consent. A study of contemporary German institutions, customs, and society.

191. *Special Topics.* I, II. 1-4 hr.* PR: Consent.

195. *Field Experience.* I, II, S. 1-18 hr.* PR: Consent.

243. *Medieval German Literature.* I. 3 hr. PR: 18 hr. of German or consent.

245. *Classicism and Romanticism.* I. 3 hr. PR: 18 hr. of German or consent. Critical study of German literature from 1750 to 1830.

246. *The Liberal Age.* II. 3 hr. PR: 18 hr. of German or consent. Critical study of German literature from 1830 to 1880.

247. *The Age of Crisis.* I. 3 hr. PR: 18 hr. of German or consent. A critical study of German literature from 1880 to present.

292. *Pro-Seminar.* 1-6 hr.* PR: Consent. Special topics.

301. *Independent Reading.* I. 3 hr. PR: Consent. Supervised reading for students who wish to do intensive work in any field of interest.

*Variable credit courses normally carry 3 hours credit. Exceptions are made only in emergencies and must be approved by the Department Chairperson and the professor teaching the course.

302. *Independent Reading.* II. 3 hr. PR: Ger. 301. Continuation of Ger. 301.

305. *Fundamentals of Reading German.* I. 3 hr. PR: Graduate status or upper-division standing. *(Ger. 305-306 is intended for graduate students from other departments to teach them to read general and technical German.)*

306. *Reading German.* II. 3 hr. PR: 12 hr. of German or equiv., or Ger. 305. *(Graduate students may meet a doctoral foreign language requirement by achieving a grade of B or better in this course.)*

361. *Lyric Poetry.* I. 3 hr. PR: 24 hr. of German, or consent. *(Course will not be offered in 1986-87.)*

376. *The Modern Novel.* I, II. 3 hr. PR: 24 hr. of German or consent. A study of representative modern novels from 1900 to 1945.

391. *Advanced Topics.* I, II. 1-6 hr. PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

392. *Seminar.* 1-6 hr.* PR: Graduate standing or consent. Special topics.

397. *Master's Degree Research or Thesis.* I, II. 1-15 hr. PR: Consent. Research activities leading to a thesis, problem report, research paper, or equivalent scholarly project.

Courses of Instruction in Hausa (Hausa)

Lower Division

1. *Elementary Hausa.* I. 3 hr. *(Course will not be offered in 1986-87.)*
2. *Elementary Hausa.* II. 3 hr. Continuation of Hausa 1. *(Course will not be offered in 1986-87.)*
3. *Intermediate Hausa.* I. 3 hr. PR: Hausa 1, 2 or equiv. *(Course will not be offered in 1986-87.)*
4. *Intermediate Hausa.* II. 3 hr. PR: Hausa 3 or equiv. *(Course will not be offered in 1986-87.)*

Courses of Instruction in Hebrew (Hebrw.)

Lower Division

1. *Elementary Modern Hebrew.* I. 3 hr. *(Course will not be offered in 1986-87.)*
2. *Elementary Modern Hebrew.* II. 3 hr. Continuation of Hebrw. 1. *(Course will not be offered in 1986-87.)*
3. *Intermediate Hebrew.* I. 3 hr. PR: Hebrw. 1, 2 or equiv. *(Course will not be offered in 1986-87.)*
4. *Intermediate Hebrew.* II. 3 hr. PR: Hebrw. 3 or equiv. *(Course will not be offered in 1986-87.)*

Upper Division

191. *Special Topics.* I, II. 1-4 hr.* PR: Consent.

Courses of Instruction in Italian (Ital.)

1. *Elementary Italian.* I. 3 hr.
2. *Elementary Italian.* II. 3 hr. Continuation of Ital. 1.
3. *Intermediate Italian.* I. 3 hr. PR: Ital. 1, 2, or equiv.
4. *Intermediate Italian.* II. 3 hr. PR: Ital. 3 or consent. Continuation of Ital. 3.

*Variable credit courses normally carry 3 hours credit. Exceptions are made only in emergencies and must be approved by the Department Chairperson and the professor teaching the course.

Upper Division

109. *Composition and Conversation.* I. 3 hr. PR: Ital. 4 or consent.

110. *Advanced Conversation.* II. 3 hr. PR: Ital. 4 or consent.

191. *Special Topics.* I, II. 1-4 hr.* PR: Consent.

195. *Field Experience.* I, II, S. 1-18 hr.* PR: Consent.

Courses of Instruction in Japanese (Japan.)

Lower Division

1. *Elementary Japanese.* I. 3 hr.

2. *Elementary Japanese.* II. 3 hr. Continuation of Japan. 1.

3. *Intermediate Japanese.* I. 3 hr. PR: Japan. 1, 2 or equiv.

4. *Intermediate Japanese.* II. 3 hr. PR: Japan. 3 or equiv.

Upper Division

191. *Special Topics.* I, II. 1-4 hr.* PR: Consent.

Courses of Instruction in Language Teaching Methods (Lang.)

Upper Division

191. *Special Topics.* I, II, S. 1-4 hr.* PR: Consent.

195. *Field Experience.* I, II, S. 1-18 hr.* PR: Consent.

221. *The Teaching of Foreign Languages.* I. 3 hr. PR: Consent. Required of all students who are prospective foreign language teachers on the secondary level.

292. *Pro-Seminar.* I, II, S. 1-6 hr.* PR: Consent. Special topics.

391. *Advanced Topics.* I, II. 1-6 hr. PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

392. *Seminar.* I, II, S. 1-6 hr.* PR: Consent. Special topics.

397. *Master's Degree Research* or *Thesis.* I, II. 1-15 hr. PR: Consent. Research activities leading to a thesis, problem report, research paper, or equivalent scholarly project.

Courses of Instruction in Linguistics (Lingu.)

Lower Division

1. *Introduction to Language.* I, II, S. 3 hr. General introduction to the nature of human language—its sounds, structure, mechanisms, and forms (oral/sign); its evolution and variation, how it is learned and stored, and how it differs from animal communications systems.

2. *Introduction to Language.* I, II, S. 3 hr. Introduction to the different languages of the world. Oral and written communications.

3. *Introduction to Language Comparison.* I. 3 hr. *(No previous language experience required.)* Comparison of various Indo-European languages.

111. *Introduction to Structural Linguistics.* I, II. 3 hr. Required for foreign language majors.

Upper Division

191. *Special Topics.* I, II, S. 1-4 hr.* PR: Consent.

*Variable credit courses normally carry 3 hours credit. Exceptions are made only in emergencies and must be approved by the Department Chairperson and the professor teaching the course.

202. *Phonology.* I. 3 hr. PR: Lingu. 1, 111 or consent. Description of sounds and sound systems in language. Articulatory phonetics. Structuralist and generative approaches to phonemics.

217. *Structure of Spanish.* I. 3 hr. PR: 18 hr. of Spanish and Lingu. 111 or consent. Description of the phonological or grammatical systems of Spanish, with emphasis on contrastive analysis (Spanish/English) and applied linguistics.

247. *Structure of Modern French.* I. 3 hr. PR: 18 hr. of French and Lingu. 111 or consent. Study of phonology, morphology, and syntax of modern French together with a contrastive analysis of French and English.

257. *Structure of German.* II. 3 hr. PR: 18 hr. of German and Lingu. 111 or consent. Phonological, morphological, and syntactical structure of contemporary German language.

267. *Structure of Russian.* II. 3 hr. PR: 18 hr. of Russian and Lingu. 111 or consent. Phonological, morphological, and syntactical structure of contemporary Russian. *(Course will not be offered in 1986-87.)*

283. *Transformational Grammar.* S. 3 hr. PR: Lingu. 111 and consent. Emphasis on generative syntax in English, German, Romance, and Slavic languages.

284. *History of Linguistics.* I. 3 hr. PR: Lingu. 111 or consent. Development of linguistics from Greeks and Romans to contemporary researchers with concentration on major linguists and schools of the nineteenth and twentieth centuries.

287. *Psycholinguistics.* I. 3 hr. PR: Lingu. 111 or consent. Provides an insight into the many areas of psycholinguistic study, including language acquisition, sentence processing, animal communication, dichotic listening, aphasia, and semantics.

288. *Sociolinguistics.* I. (Alternate Years.) 3 hr. PR: Lingu. 1 or 111 or consent. Linguistic study of geographical and social variation in languages; effects of regional background, social class, ethnic group, sex, and setting; outcomes of conflict between dialect and between languages.

292. *Pro-Seminar.* 1-6 hr.* PR: Consent. Special topics.

311. *History of the Spanish Language.* II. (Alternate Years.) 3 hr. PR: 18 hr. of Spanish and Lingu. 111 or consent. Evolution of Castilian from Vulgar Latin to its modern standard form through a study of historical phonology, morphology, and syntax, together with the external factors which influenced the development of the language.

313. *Old Spanish.* II. 3 hr. PR: Consent.

341. *History of the French Language.* II. (Alternate Years.) 3 hr. PR: 18 hr. of French and Lingu. 111 or consent. Evolution of French from Vulgar Latin into the Modern French standard through a study of historical phonology, morphology, and syntax together with the external factors which influenced the development of the language.

343. *Old French.* I. 3 hr. PR: Consent. Study of the oldest monuments of the French language including the Chanson de Roland and Aucassin et Nicolette in an effort to trace the evolution of Francien, Anglo-Norman, and Picard from Vulgar Latin.

351. *History of the German Language.* II. (Alternate Years.) 3 hr. PR: 18 hr. of German and Lingu. 111 or consent. Historical development of standard German with emphasis on its relationship to the other German languages and dialects.

*Variable credit courses normally carry 3 hours credit. Exceptions are made only in emergencies and must be approved by the Department Chairperson and the professor teaching the course.

353. *Middle High German 1.* I. 3 hr. PR: 18 hr. of German and Lingu. 111 or consent. Study of the linguistic developments of Middle High German from the eleventh to the fifteenth centuries with illustrative reading from the Neibelungenlied. *(Course will not be offered in 1986-87.)*

354. *Middle High German 2.* II. 3 hr. PR: Lingu. 353. Continuation of Lingu. 353 with illustrative readings from the Middle High German lyric poets and the courtly epics. *(Course will not be offered in 1986-87.)*

361. *History of the Russian Language.* II. (Alternate Years.) 3 hr. PR: 18 hr. of Russian and Lingu. 111 or consent. Development of Russian from Indo-European to the present.

391. *Advanced Topics.* I, II. 1-6 hr. PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

392. *Seminar.* 1-6 hr.* PR: Consent. Special topics.

397. *Master's Degree Research or Thesis.* I, II. 1-15 hr. PR: Consent. Research activities leading to a thesis, problem report, research paper, or equivalent scholarly project.

Courses of Instruction in Polish (Polsh.)

Lower Division

1. *Elementary Polish.* I. 3 hr. *(Course will not be offered in 1986-87.)*
2. *Elementary Polish.* II. 3 hr. PR: Polsh. 1. Continuation of Polsh. 1. *(Course will not be offered in 1986-87.)*

Courses of Instruction in Portuguese (Port.)

Lower Division

1. *Elementary Portuguese.* I. 3 hr. *(Course will not be offered in 1986-87.)*
2. *Elementary Portuguese.* II. 3 hr. *(Course will not be offered in 1986-87.)*
3. *Intermediate Portuguese.* I. 3 hr. PR: Port. 1, 2, or equiv. *(Course will not be offered in 1986-87.)*
4. *Intermediate Portuguese.* II. 3 hr. PR: Port. 3 or equiv. *(Course will not be offered in 1986-87.)*

Courses of Instruction in Russian (Russ.)

Lower Division

1. *Elementary Russian.* I. 3 hr.
2. *Elementary Russian.* II. 3 hr. Continuation of Russ. 1.
3. *Intermediate Russian.* I. 3 hr. PR: Russ. 1, 2, or equiv.
4. *Intermediate Russian.* II. 3 hr. PR: Russ. 3 or consent. Continuation of Russ. 3.

Upper Division

103. *Advanced Russian.* I. 3 hr. PR: Russ. 3, 4, or consent.

104. *Advanced Russian.* II. 3 hr. PR: Russ. 103 or consent.

105. *The Russian Short Story.* I. 3 hr. PR: 12 hr. of Russian or equiv.

106. *The Russian Short Story.* II. 3 hr. PR: 12 hr. of Russian or equiv. Continuation of Russ. 105.

*Variable credit courses normally carry 3 hours credit. Exceptions are made only in emergencies and must be approved by the Department Chairperson and the professor teaching the course.

109. *Advanced Russian.* I. 3 hr. PR: Russ. 104 or consent.

110. *Advanced Russian.* II. 3 hr. PR: Russ. 109 or consent.

144. *Survey of Russian Literature.* I. 3 hr. PR: Russ. 3, 4, or consent.

145. *Survey of Russian Literature.* II. 3 hr. PR: Russ. 144. Continuation of Russ. 144.

292. *Pro-Seminar.* I, II. 1-6 hr.* PR: 18 hr. of Russian or equiv.

305. *Reading Russian.* I. 3 hr. PR: Graduate or upper-division standing. *(Russ. 305-306 is intended for graduate students from other departments to teach them to read general and technical Russian.)*

306. *Reading Russian.* II. 3 hr. PR: 12 hr. of Russian or equiv. or Russ. 305. *(Graduate students may meet the doctoral foreign language requirements by achieving a grade of B or better in this course.)*

391. *Advanced Topics.* I, II. 1-6 hr. PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

Courses of Instruction in Spanish (Span.)

Lower Division

1. *Elementary Spanish.* I, II. 3 hr.

2. *Elementary Spanish.* I, II. 3 hr. Continuation of Span. 1.

3. *Intermediate Spanish.* I, II. 3 hr. PR: Span. 1, 2, or equiv.

4. *Intermediate Spanish.* I, II. 3 hr. PR: Span. 3 or consent. Continuation of Span. 3.

10. *Intensive Elementary Spanish.* I. 6 hr. The equivalent of Span. 1 and 2 combined into one course.

11. *Intensive Intermediate Spanish.* II. 6 hr. PR: Span. 1 and 2 or 10 or consent. The equivalent of Span. 3 and 4 combined into one course.

23. *Intermediate Spanish: Reading.* I. 3 hr. PR: Span. 1 and 2 or equiv. Intermediate Spanish with concentration on reading comprehension. *(Course will not be offered in 1986-87.)*

24. *Intermediate Spanish: Reading.* I, II. 3 hr. PR: Span. 1, 2, and 3 or Span. 23 or equiv. Continuation of Span. 23. *(Course will not be offered in 1986-87.)*

33. *Intermediate Spanish: Cultural Emphasis.* I. 3 hr. PR: Span. 2 or equiv. *(Course will not be offered in 1986-87.)*

34. *Intermediate Spanish: Cultural Emphasis.* II. 3 hr. PR: Span. 3 or equiv. Continuation of Span. 33. *(Course will not be offered in 1986-87.)*

Upper Division

103. *Advanced Spanish.* I. 3 hr. PR: Span. 3, 4, or consent.

104. *Advanced Spanish.* II. 3 hr. PR: Span. 103 or consent.

109. *Advanced Spanish.* I. 3 hr. PR: Span. 104 or consent.

110. *Advanced Spanish.* II. 3 hr. PR: Span. 109 or consent.

116. *Civilization and Culture.* I. 3 hr. PR: 12 hr. of Spanish or equiv.

117. *Spanish-American Literature.* I. 3 hr. PR: 12 hr. of Spanish or equiv.

*Variable credit courses normally carry 3 hours credit. Exceptions are made only in emergencies and must be approved by the Department Chairperson and the professor teaching the course.

118. *Spanish-American Literature.* II. 3 hr. PR: 12 hr. of Spanish or equiv.

121. *Peninsular Literature Before 1800.* I. 3 hr. PR: Span. 3 and 4, or equiv., and preferably Span. 109. Reading and discussion of selections from representative works from the beginning of Spanish literature to the end of the eighteenth century together with an examination of those cultural factors which influenced the literature.

122. *Peninsular Literature Since 1800.* II. 3 hr. PR: Span. 3 and 4, or equiv., and preferably Span. 109. Readings in Spanish Peninsular literature of the Romantic, Realistic, and Naturalistic schools of the nineteenth century, the Generation of '98, and the various twenthieth-century writers down to the present day.

191. *Special Topics.* I, II. 1-4 hr.* PR: Consent.

221. *Golden Age Literature.* II. 3 hr. PR: 24 hr. of Spanish or consent. Consideration of Spanish literature of the Renaissance and the Counter Reformation with readings in the novel, the *comedia*, and lyric poetry.

223. *Estudios de Estilo.* I. 3 hr. PR: 18 hr. of Spanish or equiv.

224. *Introduccion a la literatura.* II. (Alternate Years.) 3 hr. A study of basic genres, themes, and techniques. Intensive reading of selected texts from various periods. Emphasis on Penisular and/or Spanish American Literature.

292. *Pro-Seminar.* 1-6 hr.* PR: Consent. Special topics.

315. *Lyric Poetry.* I. 3 hr. PR: 24 hr. of Spanish or equiv.

324. *Explicacion de Textos.* II. (Alternate Years.) 3 hr. PR: 24 hr. of Spanish or equiv.

325. *The Picaresque Novel.* I. 3 hr. PR: 24 hr. of Spanish or equiv.

391. *Cervantes.* II. 3 hr. PR: 24 hr. of Spanish or consent.

392. *Seminar.* 1-6 hr.* PR: Consent. Special topics.

395. *Sixteenth Century Literature.* I. 3 hr. PR: B.A. in Spanish or consent.

397. *Master's Degree Research or Thesis.* I, II. 1-15 hr. PR: Consent. Research activities leading to a thesis, problem report, research paper, or equivalent scholarly project.

Courses of Instruction in Swahili (Swah.)

Lower Division

1. *Beginning Swahili.* I. 3 hr. *(Course will not be offered in 1986-87.)*
2. *Beginning Swahili.* II. 3 hr. PR: Swah. 1. Continuation of Swah. 1. *(Course will not be offered in 1986-87.)*
3. *Intermediate Swahili.* I. 3 hr. PR: Swah. 1, 2, or equiv. *(Course will not be offered in 1986-87.)*
4. *Intermediate Swahili.* II. 3 hr. PR: Swah. 3 or equiv. *(Course will not be offered in 1986-87.)*

*Variable credit courses normally carry 3 hours credit. Exceptions are made only in emergencies and must be approved by the Department Chairperson and the professor teaching the course.

Geology and Geography

Degrees Conferred—
Geography: B.A., M.A.
Geology: B.A., B.S., M.S., Ph.D.
Contact:
Alan C. Donaldson, *Chairperson*, 293-5603
Robert C. Shumaker, *Associate Chairperson*, 293-5603
Frank J. Calzonetti, *Assistant Chairperson*, 293-5603
Department is in 426 White Hall.

Faculty

Professors

Robert E. Behling, Ph.D. (Ohio St. U.). Geomorphology.
Ping-fan Chen, Ph.D. (VPI&SU)—*Adjunct.* Petroleum geology.
Alan C. Donaldson, Ph.D. (Penn St. U.)—*Chair.* Sedimentation, Stratigraphy.
Robert B. Erwin, Ph.D. (Cornell U.). Petrology.
Milton T. Heald, Ph.D. (Harvard U.)—*Emeritus.* Mineralogy, Petrology.
Peter Lessing, Ph.D. (Syracuse U.)—*Adjunct.* Environmental geology.
John C. Ludlum, Ph.D. (Cornell U.)—*Emeritus.* Structural geology, Tectonics.
Henry W. Rauch, Ph.D. (Penn St. U.). Hydrogeology, Geochemistry.
John J. Renton, Ph.D. (WVU). Geochemistry.
Richard A. Smosna, Ph.D. (U. Ill.). Carbonate sedimentation.
Francis T. C. Ting, Ph.D. (Penn St. U.). Coal geology.
Dana Wells, Ph.D. (Columbia U.)—*Emeritus.* Paleobiology.

Associate Professors

Mary C. Behling, M.S. (Miami U., Ohio)—*Adjunct.* Computer statistics.
Frank J. Calzonetti, Ph.D. (U. Okla.). Energy, Spatial modeling.
Gregory A. Elmes, Ph.D. (Penn St. U.). Spatial modeling, Transportation.
William H. Gillespie, Ph.D. (WVU)—*Adjunct.* Paleobotany.
Robert Q. Hanham, Ph.D. (Ohio St. U.). Urban and regional systems, Geostatistics.
Richard S. Little, Ph.D. (Syracuse U.). Regional development.
Kenneth C. Martis, Ph.D. (U. Mich.). Political resource, Environmental policy.
William K. Overby, Ph.D. (WVU)—*Adjunct.* Economic petroleum geology.
Douglas C. Patchen, Ph.D. (Syracuse U.)—*Adjunct.* Economic petroleum geology.
Paul W. Queen, M.S. (WVU)—*Adjunct.* Geologic drafting.

Assistant Professors

Katharine L. Avery, M.S. (U. N.C.)—*Adjunct.* Petroleum geology.
Felix L. De Cola, Ph.D. (U. Ibadan, Nigeria)—*Visiting.* Urban geography, Africa.
Chester L. Dodson, Ph.D. (WVU). Geologic hydrogeology.
William M. Dunne, Ph.D. (U. Bristol). Structural geology.
William C. Grady, M.S. (WVU)—*Adjunct.* Coal petrology.
Michael E. Hohn, Ph.D. (Ind. U.). Geostatistics.
Thomas W. Kammer, Ph.D. (Ind. U.). Paleontology.
Hobart M. King, Ph.D. (WVU)—*Adjunct.* Economic geology.
J. Steven Kite, Ph.D. (U. Wisc.). Geomorphology.
Helen Lang, Ph.D. (U. Ore.). Petrology, Mineralogy.
John Pickles, Ph.D. (Penn St. U.). Geographic theory, Africa.
Lizbeth Pyle, Ph.D. (U. Minn.). Rural land use.
Carl J. Smith, M.S. (Ind. U.)—*Adjunct.* Coal geology.
Thomas H. Wilson, Ph.D. (WVU). Geophysics.

Nature of Programs

Bachelor of Science in Geology

The Bachelor of Science degree is designed for students who want to qualify for professional positions in industry and government services, as

well as those who plan to do graduate work in geology. A total of 134 hours is required, of which a minimum of 124 hours must be established in subjects exclusive of credits earned in Physical Education and Math. 2. Electives must be chosen so as to meet the basic requirements of the College of Arts and Sciences and fulfill the University Core Curriculum.

Candidates for the Bachelor of Science in geology are required to take a total of 40 hours of geology courses. Students are urged to elect some supporting courses in such fields as mining or petroleum engineering, biology, geography, soil mechanics, pedology, and computer science, depending on their major field of geologic studies. Students planning to attend graduate school or seek employment in the oil industry should complete a full year of calculus. Electives should be chosen with the adviser's consent.

Instructional facilities and equipment include the laboratories associated with mineralogy, petrology, geochemistry, sedimentology, paleontology, geomorphology, mineral and fuel resources, and structural geology. Field studies are stressed with geologic mapping at Camp Wood in Greenbrier County; carbonate sediments and their depositional environments in the Florida Keys; sedimentation and coastal processes on the eastern shore of Virginia; pollution measurements in nearby streams and lakes; field trips to glaciated areas; examinations of processes acting on earth's surface in West Virginia; and structural and stratigraphic analyses of the Appalachian basin and orogenic belt. Subsurface logs and samples are available for study in the West Virginia Geological and Economic Survey and the nearby Morgantown Energy Technology Center of the U.S. Department of Energy.

Bachelor of Arts in Geology

The course requirements for the Bachelor of Arts with a major in geology are designed for students who want to go into careers that require a good background in the basic principles of geology. Areas such as environmental science, planning, or other earth-related sciences, secondary school teaching, or earth science laboratory technical work may be pursued by proper choice of electives.

Admission Requirements

B.S. Degree Program

Admission to the program requires at least a cumulative average of 2.25 and an average of at least 2.25 in lower-division required geology courses. To continue in the program, an average of at least 2.0 must be maintained in required chemistry, physics, mathematics, and statistics courses. At least a 2.0 average must also be maintained in required upper-division geology courses.

B.A. Degree Program

Admission to the program requires at least a cumulative average of 2.25 and an average of at least 2.25 in lower-division required geology courses and an average of at least 2.0 in required chemistry, physics, mathematics, and statistics courses. To continue in the program, an average of at least 2.0 must be maintained in required chemistry, physics, mathematics, and statistics courses. At least a 2.0 average must also be maintained in required upper-division geology courses.

Degree Requirements

Major in Geology—B.S.

Required Courses

Geol. 1 or 5, 2, 3, 4, 152, 184, 185, 221, 231, 261, 266, and 4 to 8 hours of upper-division geology electives; Chem. 15 and 16; Phys. 1 and 2 or 11 and 12; Math. 3, 4, 15, and 16 or Stat. 212 or 231; Stat. 101.

Recommended Electives

Geol. 127, 228, 235, 251, 270, 272, 274; Geog. 105, 107; C.S. 1; C.E. 1; additional biology, chemistry, physics, or mathematics courses. Geog. 7 is not an acceptable elective.

Major in Geology—B.A.

Required Courses

Geol. 1 or 5, 2, 3, 4, 127, 152, 184, 221 or 222, 231 or 235, 261; Chem. 15 and 16; Phys. 1 and 2; Math. 3 and 4; advanced science elective other than geology.

Recommended Electives

See those listed under "Major in Geology—B.S."

Courses of Instruction in Geology (Geol.)

Lower Division

1. *Physical Geology.* I, II, S. 3 hr. *(Credit cannot be obtained for both Geol. 1 and Geol. 5.)* Description of composition and structure of earth physical processes which change earth's surface. Geol. 2 not required with Geol. 1. Registration in Geol. 2 meets requirements for 4 hr. credit in a laboratory science in physical geology.

2. *Physical Geology Laboratory.* I, II, S. 1 hr. PR or Conc.: Geol. 1.

3. *Historical Geology.* I, II, S. 3 hr. PR: Geol. 1 or Geol. 5 or Conc. with consent. Evolution of earth and its inhabitants. *(Accompanied by Geol. 4 to meet requirements of 4 hr. credit in a laboratory science in historical geology.)*

4. *Historical Geology Laboratory.* I, II. 1 hr. PR or Conc.: Geol. 3.

7. *Physical Oceanography.* II. 3 hr. The geography and geology of ocean basins and margins, the chemical and physical properties of sea water, and the examination of the source and location of resources in the sea.

Upper Division

127. *Map Interpretation.* I. 2 hr. PR: Geol. 1 or 5. Relation of earth structure and history to land forms as shown on topographic maps. *(Also listed as Geog. 127.)*

151. *Structural Geology.* I. 4 hr. PR: Geol. 1 or 5, and 2 or Minerals 2 and Phys. 1 or 11 or consent. Introduction to stress, strain, and rheological behavior of geologic materials. Systematic study of types of structures, their field relationships and their development.

152. *Topics in Structural Geology.* I. 4 hr. PR: Geol. 1 or 5, Geol. 2, Geol. 184, Phys. 1 or 11, Math. 15, or consent. *(One-day field trip required at student's expense.)* Systematic study of types of structures involving their field occurrence. Introduction to the mechanistic aspects of the formation of structures. Comparative studies of structures.

184. *Mineralogy.* I. 4 hr. PR: Geol. 1, and Chem. 15 or conc. Elements of crystallography and systematic study of minerals. Identification of minerals in hand specimen by their physical properties.

185. *Introductory Petrography.* II. 4 hr. PR: Geol. 184. Introduction to the study of igneous, sedimentary and metamorphic rocks, including mineralogy, processes of formation, tectonic setting, and description and identification of rocks in hand specimen.

201. *Physical Geology for Teachers.* I, II. 3 hr. *(Credit cannot be obtained for both Geol. 201 and Geol. 1 or 5.)* PR: High school teaching certificate and consent. Composition and structure of earth and the geologic processes which shape its surface.

221. *Geomorphology.* II. 3 hr. PR: Geol. 1 or 5. *(Optional field trip at student's expense.)* An examination of the physical processes which shape the surface of the earth, with emphasis on fluvial processes and environmental geomorphology. *(Also listed as Geog. 221.)*

222. *Glacial Geology.* I. 3 hr. PR: Geol. 1 or 5. *(Optional field trip(s) at student's expense.)* Introduction to glaciology and glacial geology, with emphasis on topographic form and the nature of glacial deposits. The Quaternary history of North America is stressed.

228. *Photogeology.* II. 3 hr. PR: Geol. 127, 152, or consent. Instruction in basic and advanced techniques of air-photo interpretation.

231. *Invertebrate Paleontology.* I. 4 hr. PR: Geol. 3, 4, 184, and Stat. 101 or consent. *(Weekend field trip required at student's expense.)* Invertebrate fossils: biologic classification, evolutionary development, ecology, and use in correlation of strata.

235. *Introductory Paleobotany.* I. 4 hr. PR: Geol. 3. *(Required Saturday field trips at student's expense.)* Resume of development of principal plant groups through the ages, present distribution, mode of occurrence and index species, methods of collection.

251. *Advanced Topics in Structural Geology.* II. 4 hr. PR: Geol. 152 and 261 or consent; Math. 15; undergraduates need consent. *(Two-day field trip required. Basic field equipment and field trip at student's expense.)* Studies into the development of structures emphasizing both theoretical and experimental approaches. Two two-day field trips required. *(Offered in Spring of odd years.)*

261. *Stratigraphy and Sedimentation.* II. 3 hr. PR: Geol. 3, 4, 152, 185, or consent. *(Two-day field trip required. Basic field equipment and field trips at student's expense.)* Study of sediments and sedimentary rocks. Field techniques stressed as data gathered and interpreted from rocks of Pennsylvanian age in the Morgantown vicinity.

266. *Appalachian Geology Field Camp.* S. 6 hr. PR: Geol. 152, 185, 261, and consent. *(Living expense in addition to tuition must be paid at time of registration.)* Practical experience in detailed geological field procedures and mapping.

270. *Mineral Resources.* II. 3 hr. PR: Geol. 1, 184. Description, mode of occurrence, and principles governing the formation of ore deposits.

272. *Petroleum Geology.* II. 3 hr. PR: Geol. 152. Origin, geologic distribution, methods of exploration and exploitation, uses and future reserves of petroleum and natural gas in the world.

273. *Petroleum Geology Laboratory.* II. 1 hr. PR or Conc.: Geol. 152. Well sample description, correlation, and interpretation. Construction and interpretation of subsurface maps used in exploration for hydrocarbons.

274. *Coal Geology.* I. 3 hr. PR: Geol. 152 or consent. Introduction to the origin, composition, geologic distribution, and exploration of coals.

287. *Igneous and Metamorphic Petrology.* 4 hr. PR: Geol. 185, and Geol. 385 or consent. Review of current theories for generation and evolution of magmas, and techniques of determining metamorphic conditions from mineral assemblage. Study of igneous and metamorphic rocks in thin section. *(Weekend field trip at student's expense.)* 3 hr. lec., 1 hr. lab.

290. *Geologic Problems.* I, II, S. 1-6 hr. (12 hr. max.) PR: Consent. *(Also includes field trips such as Florida Bay carbonate trip.)* Special problems for senior and graduate students.

294. *Introduction to Geochemistry.* II. 4 hr. PR: Chem. 16. Basic review of physical and aqueous chemistry, discussion of basic geochemical processes; calcium carbonate chemistry, diagenetic processes, weathering, the silicate and iron system.

315. *Environmental Geoscience.* I. 3 hr. PR: Geol. 1 or consent for nongeology majors. *(Field trips and independent field project required.)* Principles, practice, and case histories in application of earth science to environmental problems. Includes: water quality; landslides, subsidence; waste disposal; legal aspects; and geologic aspects of land-use planning.

329. *Problems in Geomorphology.* I, II. 1-4 hr. *(Also listed as Geog. 329.)*

332. *Paleoecology.* II. 3 hr. PR: Geol. 231 and 261 or consent. Methods of paleoecologic analysis in sedimentary geology. Topics include trace fossil analysis, shell biogeochemistry, community paleoecology, biofacies analysis of basins, and Precambrian paleoecology.

341. *Carbonate Sedimentology.* II. 4 hr. PR: Geol. 231, 261. Origin and distribution of modern marine carbonate sediments as models for interpretation of ancient limestone and dolomite facies complexes. Laboratory experience in thin section petrography of skeletal and nonskeletal carbonate grains, and rock compositions and fabrics.

346. *Advanced Sedimentation.* I. 4 hr. PR: Geol. 261 or consent. *(Required field trips at student's expense.)* Origin of sedimentary rocks; principles involved in interpretation of ancient geography, climates, animals, and plants. Emphasis on detrital sediments and rocks.

351. *Tectonics.* II. 3 hr. PR: Geol. 152 and 261 or consent; Math. 15; undergraduates need consent. Theories of large-scale deformational processes operating within the earth's crust and mantle emphasizing regional structural geology outside the Appalachians. *(Offered in Spring of even years.)*

352. *Exploration Geophysics 1.* I. 4 hr. PR: Math. 15, Geol. 152, 261, or equiv. Studies in applied geophysics with particular empahsis on techniques in reflection and refraction seismology, and gravity, and their application to energy resource exploration. 3 hr. lec., 1 hr. lab.

353. *Exploration Geophysics 2.* II. 4 hr. PR: Math. 15, Geol. 152, 261 or equiv. Geologic interpretation of geophysical data with emphasis placed on structural and stratigraphic interpretation of seismic records in explorations for hydrocarbon deposits.

357. *Basin Structures.* I. 4 hr. PR: Geol. 152, 261, or equiv. The origin, development, and distribution of basins and the structure found within basins throughout the world are studied. The distribution of energy-related materials related to basins and structural accumulations are emphasized.

363. *Groundwater Hydrology.* I. 3 hr. PR: Geol. 1 or consent. Study of the principles of groundwater hydrology; occurrence, development, uses, and conservation of groundwater.

364. *Advanced Groundwater Hydrology.* II. 3 hr. PR: Geol. 1, 2, 363 or consent. Review of groundwater exploration, flow, and quality in various geologic terrains. Groundwater pollution and other environmental effects are covered, along with well pumping tests and modeling of groundwater flow.

376. *Coal Petrology.* II. 3 hr. PR: Geol. 274 or consent. Microscopic examination and determination of optical properties of coals, environment of deposition, diagenesis, and metamorphism of coals; coal chemistry and petrography.

385. *Optical Mineralogy and Sedimentary Petrology.* I. 4 hr. PR: Geol. 185 and one year of physics. Principles and practice in use of the petrographic microscope in identification of minerals by the immersion method and in thin section; emphasis on sedimentary petrology.

394. *Physical Geochemistry.* I. 3 hr. PR: Geol. 1, 184, 185; Chem. 16. Phase diagrams, metamorphic facies, origin of the elements, chemical properties of ions, crystal chemistry of minerals, element distributions, and geochemical cycles. *(Offered in Fall of even years.)*

395. *Aqueous Geochemistry.* II. 3 hr. PR: Geol. 1, Chem. 16, or consent. Review of basic chemical principles as they apply to aqueous geologic environments. Properties of water and the types, sources, and controls of the common and environmentally significant chemical species dissolved in water.

399. *Quantitative Methods in Geo-Sciences.* II. 3 hr. PR: Stat. 212 or 311 or consent. Brief review and introduction to multivariate quantitative techniques as applied to geology and geography. *(Also listed as Geog. 399.)*

Nature of Program—Geography

The undergraduate major in geography stresses our relationship to physical and human environments, and the search for explanation of the patterns and processes of human activity over the earth's surface. The general course requirements provide training for positions such as cartographers, foreign service officers, planners, researchers, market analysts, and location planners in various levels of government, business, and industry. Students also are given preparation for elementary and secondary teaching and for graduate studies in such fields as environmental studies, urban affairs, planning, and geography.

The program is structured around a core of geography courses and offers six options designed to provide training for either employment or advanced study in each emphasis area. The options include Planning, International Area Studies, Physical Environment and Resources, Cartography, Spatial Analysis, and a Generalist option for students who desire to arrange an individualized program of study. Each option lists a group of required and recommended courses from geography and other departments relevant to the particular emphasis area.

Degree Requirements

Courses Required for All Options

Geog. 7, 8 or 1, 105, 109, 140, 261, 285.

Generalist Option

Required Courses: 12 additional hours of geography, including no more than 6 hours of Geog. 219 or 295.

Planning Option

The planning option introduces the student to processes of physical and social planning which shape the spatial order of contemporary society. Emphasis is placed on both urban and rural environments. The option provides a background for careers or advanced study in urban or regional planning, locational analysis, community planning, and environmental design. A planning internship is included in the program and most of the courses have an applied orientation.

Required Courses: Geog. 110, 209, 225, 230, 295.

Recommended Electives: Ag. Ec. 200, 211; C.S. 1, 2; Econ. 255, 257; Engl. 208; Geog. 150, 215, 219, 221, 235; Pol. S. 121, 225; Spch. 14, 221; Soc. & A. 131, 222, 223; Stat. 101.

International Area Studies Option

The international area studies option allows the student to specialize in one or more regions of the world and gain a basic background in international economic, political, and cultural relationships. The program not only deals with specific regional problems, but also the global issues of colonialism, nationalism, development, international cooperation and trade, multi-national corporations and the competition and relationships between capitalist, socialist, and non-aligned nations. The international studies option gives the student an analytical background in international affairs, preparation for graduate work in various fields, and a background for employment in government, business, banking, communications, and international organizations.

Required Courses: Geog. 202, 215; Econ. 110; Pol. S. 160; 6 hours from Geog. 141, 143, 144, 145.

Recommended Electives: Econ. 213, 250; Engl. 208; Hist. 264; Pol. S. 261, 263; Soc. & A. 51.

Other courses relevant to international studies will be arranged according to the student's regional or topical specialization.

Physical Environment and Resources Option

The physical environment and resources option emphasizes the interaction between physical environmental systems and human activity. It also provides training for students interested in problems related to the exploitation of physical resources. Students gain mapping and other skills essential for analyzing environmental problems resulting from the exploitation and management of energy, mineral, land, and water resources, as well as a substantive inquiry into particular environmental and resource utilization issues. This option provides a background for employment or advanced study in environmental impact analysis, remote sensing, and environmental planning.

Required Courses: Geog. 107, 127, 200, 221, 285, 290, and 3 additional hours of geography; Geol. 1, 2, 3, 4; Chem. 11, 12.

Recommended Electives: Geog. 205, 295, 329; Biol. 254; C.E. 5, 252; Engl. 208; For. 140, 226; M.E.R. 97; Phys. 117; Pol. S. 236, 238; Stat. 101; Geol. 315, 363; C.S. 1, 2.

Other electives may be arranged as relevant to the student's particular interests.

Cartography Option

The cartography option provides specialization in the art and science of making maps. A background in geography allows the cartographer to recognize and analyze various spatial distributions which he or she must interpret and communicate to the map reader. The required courses provide a knowledge of geographical patterns, data manipulation and compilation, positive and negative artwork techniques, as well as surveying, aerial photography, and remote sensing. The student may specialize further with selected courses in order to concentrate on statistical and computer-assisted cartography or map design and construction. Internships in practical cartography are available in local planning agencies and in university research units working with mini-computer mapping systems. The cartography option prepares the student for graduate study or a career in federal, state or local government agencies or commercial mapping firms.

Required Courses: Geog. 127, 200, 262, and 6 additional hours in Geography; C.E. 5; For. 226; and 6 hours in Mathematics.

Recommended Electives: Art 121; Astro. 106; C.S. 1, 2; Engl. 208; Geog. 220, 221, 225, 235, 295; Geol. 7, 228; Journ. 1, 110, 120; Phys. 8; Psych. 1; Stat. 101, 212, 221.

Spatial Analysis Option

The spatial analysis option provides students with spatial analytic skills that are being increasingly called upon by government and industry seeking fresh approaches in decision making. Geography offers a unique spatial approach in analyzing information, and in addition to analytical techniques developed by geographers, students majoring in this option are able to apply powerful research tools to an array of problems in the physical and social sciences. This option provides a background in computing, statistical analysis, and mathematical techniques. In addition to the excellent prospects of graduates in this option to find employment in industry and government, the option provides a strong framework for those pursuing advanced or professional degrees.

Required Courses: Geog. 200, 219 (Geostatistics), and at least 6 additional hours in geography; Math. 15, 16 and at least 3 additional hours above Math. 16; Stat. 101, 212, 221, 231; C.S. 5.

Recommended Electives: Geog. 209, 215, 225; Econ. 54, 55, 220; I.E. 25, 213.

Other Options

Honors Program

Qualified students in geography are encouraged to participate in the department's Honor Program which begins either the second semester of the junior year or the first semester of the senior year and culminates in a senior thesis. Entry requires a 3.3 overall average. (See the department's Honors Coordinator.)

Courses of Instruction in Geography (Geog.)

Lower Division

1. *Introduction to Geography.* I. 3 hr. Basic principles of the discipline, including maps, climate, physiography, urban, economic, political, and cultural geography. *(Not open to students who have completed either Geog. 7 or 8.)*

2. *World Regions.* II. 3 hr. Comparison and relationships of world regions. Geographical perspectives of contemporary global problems. Developing regions contrasted with modernized regions and the consequences of their interactions.

7. *Physical Geography.* I, II. 3 hr. An introduction to the various global environmental systems operating on the earth's surface and examination of human interaction with these natural processes.

8. *Human Geography.* I, II. 3 hr. Introduction to the geographical dimension in human behavior and the human-altered landscape including social, demographic, economic, and political attributes of societies.

Upper Division

105. *Resource Utilization and the Environment.* I, S. 3 hr. An analysis of the problems associated with natural resource utilization in the United States. The functional concept of resources is defined and evaluated in terms of land-use planning, pollution abatement, and alternate resource utilization strategies.

107. *Weather and Climate.* I, II. 3 hr. Processes of weather and patterns of climate and their significance to people.

109. *Economic Geography.* II. 3 hr. Earth's land use patterns and interactions that result from our economic activities. Includes the analysis of industrial location, mineral exploitation, and agricultural patterns.

110. *Urban Geography.* I. 3 hr. Introduction to the geography of the city incorporating consideration of urban systems and city-region linkages, patterns and processes of urban land use, the social geography of the city, and contemporary urban problems.

127. *Map Interpretation.* I. 2 hr. PR: Geol. 1 or 5. Relation of earth structure and history to land forms as shown on topographic maps. *(Also listed as Geol. 127.)*

140. *United States and Canada.* I. 3 hr. Regional study of the United States and Canada emphasizing such geographic features as climate, natural vegetation, topography, natural resources, population distribution and trends, agriculture, manufacturing, transportation systems, and regional culture.

141. *Geography of Western Europe.* I or II. 3 hr. Regional characteristics, problems of development, and human ecology of the area.

143. *Geography of Africa.* I or II. 3 hr. Systematic and regional characteristics and geographic problems of political, social, and economic development.

144. *Latin America.* I or II. 3 hr. Regional study of Central America, the West Indies, and South America emphasizing such physical and human geographical factors as natural resources, climate, population characteristics and trends, culture, economic development, and political patterns.

145. *Monsoon Asia.* II. 3 hr. Study of the physical and cultural geographic patterns of southern and eastern Asia with emphasis on China, Japan, and India.

150. *Transportation Geography.* I. 3 hr. A practical and theoretical approach to transportation systems including an examination of networks, modes, and flows at different geographical scales. Emphasis is placed on transportation as a spatial factor in urban and regional development. *(Offered in Fall of even years.)*

200. *Spatial Analysis.* I. 3 hr. Introduces quantitative techniques for the collection, classification, and spatial analysis of geographical data. Emphasizes map analysis and the application of spatial analysis to geographical problems occurring in everyday contexts.

201. *Geography of West Virginia.* II. 3 hr. Study of past, present, and future patterns of the physical environment of West Virginia as modified by human activities. To learn the use of geographical information systems for planning in West Virginia.

202. *Political Geography.* II. 3 hr. Examines the interrelationship between politics and the environment, human territoriality, the political organization of space, geopolitical aspects of the nation-state and international problems.

205. *Environmentalism in the United States.* II. 3 hr. Surveys natural resource exploitation and environmental alteration in the United States from the beginning of European settlement, with consideration of changing natural resource, conservation, and environmental perceptions and policies.

209. *Industrial Location.* II. 3 hr. PR: Geog. 109 or consent. Applied theoretical aspects of location decisions in primary, secondary, and tertiary activities. Emphasis will be on the understanding of location patterns and the impact of industries on other characteristics of communities.

210. *Global Issues: Inequality and Interdependence.* II. (Alternate Years.) 3 hr. PR: Geog. 1 or 2 or 8. Themes of spatial equity and justice in an increasingly interdependent world system. Selected contemporary issues concerning location, place, movement, and region.

215. *Population Geography.* I. 3 hr. Study of the geographic distribution of population and population characteristics including density, age, fertility, mortality, and settlement patterns. Problems of migration and population/resource issues also will be covered, with an emphasis on developing countries. *(Offered in Fall of odd years.)*

219. *Problems in Geography.* I, II. 1-9 hr. PR: Consent. Independent study or special topics.

220. *Seminar in Geography.* I, II. 1-9 hr. per sem.; max. 15 hr. PR: Consent. Includes separate seminars in urban, economic, physical, behavioral, social, Appalachian, transportation, census, planning, resource, international studies, geographic model building, rural problems, cartography, aging and environment, and energy.

221. *Geomorphology.* II. 3 hr. PR: Geol. 1 or 5. *(Optional field trip at student's expense.)* An examination of the physical processes which shape the surface of the earth, with emphasis on fluvial processes and environmental geomorphology. *(Also listed as Geol. 221.)*

225. *Urban Planning Concepts and Techniques.* II. 3 hr. PR: Geog. 110 or Pol. S. 121 or consent. Explores concepts, techniques, and processes of physical and socioeconomic planning and their application to urban problems including: land-use allocation and control, location of economic activity, housing, transportation, and the delivery of social services.

230. *Rural Settlement.* I. 3 hr. Analysis of the form and process of settlement in rural and urban fringe areas. Topics include housing, employment, mobility patterns, service opportunities, and cultural characteristics of rural populations with emphasis on current patterns of change.

235. *The Experience of Space.* II. 3 hr. Explores the individual's changing experience of geographical space over the life cycle as reflected in activity patterns, territoriality, and environmental images. Traces environmental design implications for settings including schools, nursing homes, parks, and shopping malls.

261. *Cartography.* I, II. 3 hr. An introduction to mapping, including historical developments, coordinate systems, projections, generalization, symbolization, map design, computer-assisted cartography, landform representation, and data manipulation for dot, graduated symbol, chloropleth, and isarithmic maps.

262. *Cartographic Techniques.* II. 3 hr. PR: Geog. 261 or consent. Advanced map construction including positive and negative artwork, darkroom techniques, color and color proofing, and map reproduction.

265. *Aging and Environment.* II. 3 hr. PR: MDS 50 or consent. Explores the older persons's changing experience of the environment. Physiological, psychological, and social changes are related to adjustment within urban and rural community environments, special housing for the elderly, and long-term care environments.

285. *Methods of Geographic Research.* II. (Alternate Years.) 3 hr. PR: Consent. Geographic analysis as problem-solving activity. Practical experience in field techniques, library research, hypothesis formation and testing, and report preparation and presentation. Students will acquire skills in literary and numerical approaches to geographic data analysis.

290. *Geographical Perspectives on Energy.* II. 3 hr. PR: Consent. A survey of the distribution of finite, renewable, and continuous energy resources and an investigation of the geographical patterns of energy consumption and energy flows. The policy implications of an unequal distribution of energy are evaluated.

295. *Internship.* I, II, S. 1-12 hr. PR: Junior standing and consent. A working internship with an agency or company designed to give the student experience in the practical application of geographic training to specific problems.

299. *Honors Thesis.* I, II, S. 3-6 hr. PR: Departmental consent. Thesis proposal, writing, and defense for students admitted to the Honors Program.

329. *Problems in Geomorphology.* I, II. 1-4 hr. *(Also listed as Geol. 329.)*

399. *Quantitative Methods in Geo-Sciences.* II. 3 hr. PR: Stat. 212 or 311 or consent. Brief review and introduction to multivariate quantitative techniques as applied to geology and geography. *(Also listed as Geol. 399.)*

History

Degrees Conferred: B.A., M.A., Ph.D.
Contact:
Robert M. Maxon, *Chairperson*, 293-2421
John C. Super, *Associate Chairperson and Director of Graduate Studies*, 293-2421
Department is in 202 Woodburn Hall.

Faculty

Professors

Wesley M. Bagby, Ph.D. (Columbia U.). Recent United States. U.S. diplomatic.
William D. Barns, Ph.D. (WVU)—*Emeritus.*
John A. Caruso, Ph.D. (WVU)—*Emeritus.*
Elizabeth Cometti, Ph.D. (U. Va.)—*Emeritus.*
William T. Doherty, Ph.D. (U. Mo.). Modern United States. American south, Social and intellectual, Historiography.
Thomas J. Knight, Ph.D. (U. Tex.). Modern Europe. Diplomatic, Intellectual.
Mortimer Levine, Ph.D. (U. Penn)—*Emeritus.*
Ronald L. Lewis, Ph.D. (U. Akron). Modern United States. West Virginia/Appalachia, Labor, Ethnic relations.
Robert M. Maxon, Ph.D. (Syracuse U.)—*Chair.* Africa. East Africa, Economic and imperial.
Edward M. Steel, Jr., Ph.D. (U. N.C.)—*Emeritus.*

Associate Professors

William S. Arnett, Ph.D. (Ohio St. U.). Ancient. Egyptology, Aging and elderly in ancient Middle East.

Charles W. Connell, Ph.D. (Rutgers U.). Medieval. Attitudes, Culture, Historiography of Middle Ages.

Jack L. Hammersmith, Ph.D. (U. Va.). Modern United States. East Asia, U.S. diplomatic, U.S.-Japanese relations.

Elizabeth K. Hudson, Ph.D. (Ind. U.). Renaissance and Reformation. Education and religion.

John A. Maxwell, Ph.D. (WVU). Modern Europe. East and West Germany, Military history.

Stephen C. McCluskey, Ph.D. (U. Wisc.). Medieval science and technology, Astronomies of non-literate cultures.

W. Reynolds McLeod, Ph.D. (U. Md.). Great Britain. Celtic Europe (Scotland), Popular history, Newspaper history.

Dennis H. O'Brien, Ph.D. (U. Ill.). Early Modern Europe. France, Diplomatic history.

George P. Parkinson, Jr., Ph.D. (U. Wisc.). Early United States. Colonial and Antebellum, Appalachian history, Archives.

Sarah R. Smith, Ph.D. (Columbia U.)—*Emerita.*

John C. Super, Ph.D. (UCLA). Latin America, Spain. Early Latin America, Biography, Food and agriculture.

Assistant Professors

Robert E. Blobaum, Ph.D. (U. Nebr.). Russia, East Europe. Poland, 20th century political and social history.

Phyllis J. Boanes, Ph.D. (Northwestern U.). West Africa. Ghana, Afro-American.

Barbara J. Howe, Ph.D. (Temple U.). Modern United States. Public history, U.S. urban and women's history.

Rosemarie Zagarri, Ph.D. (Yale U.). Early United States. American social and political history, Constitutional history.

Nature of Program

The Bachelor of Arts degree with a major in History is designed to prepare students for careers in teaching, business, and government and for graduate work in history, law, and related social sciences and humanities. The department offers courses focusing on a variety of world regions and time periods. Degree requirements seek to insure that majors obtain an acquaintance with the history of several such regions and periods and that they develop skills in research and writing.

Admissions Requirements

Students may be admitted to the degree program upon the completion of 58 hours with an overall grade-point average of at least 2.0. Each major will be assigned a faculty adviser. Students should have attained at least a 2.0 average in history courses.

Degree Requirements

History majors must meet university and college requirements for the Bachelor of Arts degree. The Department of History requires the following:

1. History majors must complete a total of 33 hours (including Hist. 1 and 2, 52 and 53, and 290) of work in history, of which at least 21 hours are to be selected from upper-division courses. Majors should divide these 33 hours between American and non-American fields with at least one course from the fields of African, Asian, and Latin American history. (See Groups I and II below.)

2. History majors are required to complete a minor of at least 9-12 upper-division hours in a related subject, exclusive of hours used to satisfy other departmental requirements.

3. History majors are required to achieve a 2.0 (C) average for all courses attempted in the major subject.

History Courses

Group I (American): Hist. 4, 52, 53, 141, 142, 153, 155, 156, 157, 159, 161, 175, 209, 212, 245, 251, 252, 253, 257, 259, 261, 263, 264, 266, 267, 268, 269, 274.

Group II (Non-American): Hist. 1, 2, 5, 6, 11, 12, 100, 101, 103, 105, 107, 109, 117, 118, 119, 120, 121, 122, 200, 201, 202, 204, 205, 206, 207, 208, 210, 213, 214, 215, 216, 217, 218, 222, 225, 226, 227, 228, 229, 230, 231, 232, 241, 242, 246.

With the approval of the student's adviser and the chairperson of the department, the student may elect options at the 300-course level. (See the *WVU Graduate Catalog.*)

Options

Program in the History of Science and Technology. See page 171 for a description of the program. Courses are offered through the Department of History.

Courses of Instruction in History (Hist.)

Lower Division

1. *Western Civilization: Antiquity to 1600.* 3 hr. *(Hist. 1 does not have to precede Hist. 2.)* A survey of the major developments in Western civilization beginning with the ancient Mediterranean world and concluding with Reformation Europe.

2. *Western Civilization: 1600 to Present.* 3 hr. *(Hist. 2 may precede Hist. 1.)* A survey of major developments in Western civilization from 1600 to the present with attention to Europe's emerging industrial society and changing role in world affairs.

4. *Latin America: Past and Present.* 3 hr. Introduction to Latin American history, stressing the relationship between the past and present. Special emphasis is given to economic problems, political development, and social change in modern Latin America.

5. *Africa and the Middle East.* 3 hr. Introduction to the history of Africa and the Middle East. Special attention is given to political developments, economic problems, relations with the West, and cultural patterns and changes in the modern era.

6. *East Asia: An Introduction.* 3 hr. Focuses on modern China, Japan, and Korea. Consideration of important problems facing each nation today together with the cultural and historical developments which help explain contemporary affairs in East Asia.

11. *Science, Magic, and Religion.* 3 hr. Examination of the historical development of scientific ideas from the beginning of Western culture through establishment of Newtonian natural philosophy.

12. *Modern Science: Forces, Energy, Order.* 3 hr. Examination of the historical development and interaction of major themes of scientific thought from the beginning of the eighteenth century through the industrial revolution to the present.

52. *Growth of the American Nation to 1865.* 3 hr. *(Hist. 52 does not have to precede Hist. 53.)* Examines the basic political, economic, and social forces in formation and development of United States before 1865. Emphasis on national development from independence through Civil War.

53. *Making of Modern America, 1865 to the Present.* 3 hr. *(Hist. 53 may precede Hist. 52.)* Continues the examination of basic political, economic, and social forces in the development of the United States since the Civil War.

Upper Division

100. *Introduction: Medieval-Renaissance Culture.* II. 3 hr. PR: Hist. 1 or consent. Examination of the intellectual, literary, and aesthetic achievements of the two ages and the societies which produced them, concentrating primarily on feudal France and urban Italy between 800-1500.

101. *History of Ancient Times: Stone Age to the Fall of Rome.* 3 hr. Ancient civilizations of the Near East and the Mediterranean.

103. *Medieval Europe: Fall of Rome to the Renaissance.* 3 hr. Historical development of civilization in Europe from 300 to c. 1300 A.D. Semi-topical approach with attention to problems of church development, cultural conflict, church-state relations, social-economic expansion, and intellectual evolution.

105. *Early Modern Europe: Renaissance to the Enlightenment.* 3 hr. Concentrates on political and social developments between 1300-1715 with attention to the Reformation crisis, the seventeenth-century struggle for effective government in England and France, the realignment of European powers, and the rise of modern science.

107. *Revolutionary Europe.* 3 hr. Traces the development of European history from the reign of Louis XV to the end of the Franco-Prussian War. Political and social history emphasized.

109. *Twentieth Century Europe.* 3 hr. Traces the major political, economic, and social developments of Europe from World War I to the present.

111. *Special Topics in History.* 1-3 hr. *(May be repeated for a maximum of 9 credit hours as long as content for each semester of Hist. 111 is different.)* Selected topics in history.

117. *History of Russia: From Kiev to Nicholas I.* 3 hr. Interdisciplinary approach integrating political, social, economic, diplomatic, and cultural studies to provide more than an introduction to the history of Russia. In-depth study of the various aspects of Russian life in an attempt to provide an understanding of the forces which produced the Russian autocracy.

118. *History of Russia: From the Emancipation to the Present.* 3 hr. Using the same approach as in Hist. 117, an attempt is made to follow the changes which turned an underdeveloped country into one of the major world powers.

119. *British Civilization to 1660.* 3 hr. History of Britain, mainly England, from the earliest times to the Restoration. Political, constitutional, diplomatic, economic, social, religious, intellectual, and cultural developments considered.

120. *British Civilization Since 1660.* 3 hr. History of Britain, mainly England, from the Restoration to the present.

121. *History of Modern Germany.* 3 hr. German history from Congress of Vienna to the end of World War II. Student gains special knowledge of more specialized topics by selecting literature and writing essays on these topics.

122. *Hitler and the Third Reich.* 3 hr. A study of the myths and realities of Hitler's private and public life. Emphasis on his rise to power, particularly his party, ideology, and propaganda techniques, and his position and policies as Fuehrer.

141. *Latin America: Culture, Conquest, Colonization.* 3 hr. History of the formative period of Latin America, emphasizing the social and economic interaction between Indians, Europeans, and blacks from the conquest to the wars for independence in the early nineteenth century.

142. *Latin America: Reform and Revolution.* 3 hr. History of modern Latin America, concentrating on the durability of nineteenth-century social, economic, and political institutions, and the twentieth-century reformist and revolutionary attempts to change those institutions.

153. *West Virginia.* 3 hr. Historical foundations and development of West Virginia, with particular emphasis upon the growth of the government, the economy, and the traditions of the state.

155. *History of American Colonial Society, 1607-1763.* 3 hr. The planting and maturation of the English colonies of North America. Relationships between Europeans and Indians, constitutional development, religious ferment, and the colonial economy are studied.

156. *History of the American Revolution, 1763-1790.* 3 hr. The immediate origins and long-range consequences of the movement for independence from Great Britain; includes the 1775-1790 controversy over the charter of new state and federal governments.

157. *Antebellum America, 1781-1861.* 3 hr. *(Completion of Hist. 52 is advised.)* American history from the Revolution to the Civil War is followed in detail, with particular attention to the formation and operations of government under the Confederation and the Constitution, the development of political parties, the beginnings of industrialization, and the sectional struggles that culminated in war.

159. *The United States, 1865-1918.* 3 hr. Development of the United States during the most intensive phase of American industrialization; special emphasis on ideas of selected Americans on how to cope with the increase in poverty and social malaise which accompanied economic development; attention is also given to the roots of American imperialism.

161. *Recent America, The United States Since 1918.* 3 hr. *(Primarily for non-History majors.)* The 1920's, the New Deal, World War II, and a survey of developments since World War II.

175. *The Coal Industry in America.* 3 hr. The historical development of the coal industry: the technology of extraction, the political and economic context, the United Mine Workers of America, and the particular social problems of the industry will be emphasized.

177. *Nuclear Power and Society.* II. 3 hr. Big science as a political force, the arms race and international tensions, the A-bomb spies and McCarthyism, and the promises and failures of cheap, safe, and clean atomic power. No scientific background assumed. *(Offered alternate Spring semesters, even years.)*

200. *Greece and Rome.* 3 hr. Covers the Minoan and Mycenaean civilizations, Archaic and Classical Greece. Alexander the Great and the Hellenistic Age, the Roman Republic, the Etruscan and Carthaginian states, and the rise of the Roman Empire.

201. *Social and Economic History of the Middle Ages, 300-1000.* 3 hr. *(Hist. 103 is recommended as preparation.)* The social-economic crisis of the late Roman and German institutions, the Merovingian and Carolingian economies, Pierenne Thesis, and transition to feudal society.

202. *Social and Economic History of the Middle Ages, 1000-1500.* 3 hr. (Hist. 103, 201 are recommended as preparation.) Feudal society, land and population expansion, fairs, towns, leagues, Italian leadership, crusades, church influence, black death, fourteenth-century revolts, and general decline of late Middle Ages.

204. *Ancient and Medieval Science.* 3 hr. Examination of scientific achievements from ancient myths to medieval philosophies of nature. Stresses the internal coherence of the approaches to nature taken by various cultures. No scientific background is assumed.

205. *The Renaissance.* 3 hr. The underlying political, economic, and social structure of fourteenth and fifteenth century Italy with concentration on the significant intellectual and cultural trends which characterized the age. Some consideration given to the problem of the impact of the early Reformation movement upon Renaissance culture.

206. *The Reformation.* 3 hr. Distinguishing theological characteristics of the major Reformation movements with concentration on the effect of religious-intellectual crisis on the political and social structure of the sixteenth century.

207. *Early European Science and Culture.* 3 hr. Examination of European intellectual history from the Renaissance to the early eighteenth century with particular attention being paid to the contributions of Copernicus, Bacon, Descartes, Kepler, Galileo, and Newton.

208. *Science and Society, 1750-1914.* 3 hr. Historical examination of the relationship between science and technology with particular attention being paid to the doctrines of Positivism, Darwinism, and Scientific Socialism.

209. *Brazil: Colony to World Power.* 3 hr. Examines the transition of Brazil from a colony to a world power, with special emphasis on recent economic developments, regional diversity, political patterns, foreign affairs, and race relations.

210. *Modern Spain.* 3 hr. Survey of the Moslem, Hapsburg, and Bourbon periods followed by an examination of modern political and social forces, the Civil War, and the rule of Franco.

211. *Technology in the Industrial Revolution.* 3 hr. Technological and social change in Great Britain and the United States. Case studies illustrating the nature of technological development and providing an understanding of the ways in which technology has shaped human experience.

212. *Introduction to Public History.* 3 hr. Introduction to a wide range of career possibilities for historians in areas such as archives, historical societies, editing projects, museums, business, libraries, and historic preservation. Lectures, guest speakers, field trips, individual projects.

213. *Bourbon France.* 3 hr. French history from the reign of Henry IV to the reign of Louis XVI. Special attention given to the reigns of Louis XIII and Louis XIV. Political, cultural, and intellectural history.

214. *The Revolutionary-Napoleonic Era.* 3 hr. French history from mid-eighteenth century to 1815. Special attention given to the background of the French Revolution of 1789, to the political and social history of the revolution, and to Napoleon's nonmilitary achievements.

215. *European Diplomatic History, 1815 to 1919.* 3 hr. Develops an understanding of the forces, men, and events which determined diplomatic relations between the major powers.

216. *European Diplomatic History, 1919 to Present.* 3 hr. Scope similar to Hist. 215.

217. *Diplomatic History of the U.S.S.R., 1917 to 1939.* 3 hr. Detailed study of Soviet diplomatic history, with emphasis on the view from the Kremlin balanced by the responses of other powers. Understanding of European diplomatic history desirable. *(Course will not be offered in 1986-87.)*

218. *Diplomatic History of the U.S.S.R., 1939 to Present.* 3 hr. Scope similar to Hist. 217. *(Course will not be offered in 1986-87.)*

222. *Twentieth-Century Germany from Weimar to Bonn.* 3 hr. The Weimar Republic, the Third Reich, and the two German states created after World War II.

225. *History of Modern China.* 3 hr. Introduction to modern China (since 1839) with attention to China's Confucian heritage; the Chinese effort to modernize in the face of Western diplomatic and economic pressure; specific attention to China's Nationalist and Communist revolutionary traditions.

226. *History of Modern Japan.* 3 hr. Modern Japan (since 1868) with attention to development of Japanese institutions and ideas in earlier periods, especially the Tokugawa Era (1600-1868); examines the rapid pace of economic change in the nineteenth and twentieth centuries along with the important social, political, and diplomatic implications of this change.

227. *East Africa to 1895.* 3 hr. East Africa from earliest times to the beginning of European control. Population movement and interaction, development of varying types of polity, revolutionary changes, and the European scramble for East Africa form the major focus.

228. *East Africa Since 1895.* 3 hr. History of colonial rule and movement to independence in East Africa. Political, economic, and social changes will be examined with particular emphasis on the rise and triumph of African nationalism.

229. *History of Africa: Pre-Colonial.* 3 hr. History of Africa from earliest times to the middle of the nineteenth century. Particular emphasis on population and interaction, state formation, and the development of trade in sub-Saharan Africa as well as the impact of such external influences as Christianity and Islam. *(Course will not be offered in 1986-87.)*

230. *History of Africa: European Dominance to Independence.* 3 hr. History of Africa from the middle of the nineteenth century to the 1960s. Political and economic trends will form major focus. *(Course will not be offered in 1986-87.)*

231. *Seventeenth Century Britain, 1603-1715.* 3 hr. The more significant political, social, economic, religious, and intellectual developments of Britain during a century of revolution and of the men and women who interacted with those movements. *(Course will not be offered in 1986-87.)*

232. *Eighteenth Century Britain, 1715-1832.* 3 hr. The "Age of Aristocracy," the political, social, religious, economic, and intellectual forces which produced it, and the reasons for its decline under the combined impact of the Industrial, Agricultural, American, and French revolutions. *(Course will not be offered in 1986-87.)*

241. *English Social History, Fourteenth to Eighteenth Century.* 3 hr. Topical examination of English society from the time of Chaucer to Milton. Major topics: society in town and country, economy, politics, religion, and thought. *(Course will not be offered in 1986-87.)*

242. *English Social History, Eighteenth Century to the Present.* 3 hr. Topical examination of English society from the time of Queen Anne to the present. *(Course will not be offered in 1986-87.)*

245. *History of American Women.* 3 hr. Examination of the history of American women from 1607 to the present, with emphasis on working conditions, women's rights, development of feminism, women's role in wartime, and women in the family.

246. *History of European Women.* 3 hr. A survey of the history of European women from antiquity to the present, with emphasis on the philosophic, economic, and societal sources of women's oppression and on women's role in work, the family, and feminist movements.

251. *Afro-American History to 1865.* 3 hr. African background, the slave trade and evolution of slavery in the New World. The attack on slavery and its destruction.

252. *Afro-American History Since 1865.* 3 hr. Reconstruction, the age reaction and racism, black migration, black nationalism, blacks in the world wars, and desegregation.

253. *Civil War and Reconstruction.* 3 hr. Causes as well as constitutional and diplomatic aspects of the Civil War; the role of the American black in slavery, in war, and in freedom; and the economic and political aspects of Congressional Reconstruction.

257. *The United States From McKinley to the New Deal, 1896 to 1933.* 3 hr. American national history from William McKinley to Franklin D. Roosevelt. Particular attention is given to great changes in American life after 1896; national political, economic, social, and cultural development; the Progressive Era in American politics; and alterations in American foreign relations resulting from the Spanish-American War and World War I.

259. *Recent American History, 1933 to Present.* 3 hr. American national history from the inauguration of Franklin D. Roosevelt to the present. Emphasis on the New Deal; Roosevelt's foreign policies and their impact on American social, technological, and cultural developments; and United States domestic problems and foreign relations since 1945.

261. *Economic and Social Development of West Virginia.* 3 hr. Regional study of the economic, social, technological, cultural, and religious history of West Virginia.

263. *American Diplomacy to 1941.* 3 hr. *(Assumes some knowledge of the period such as that obtained in Hist. 52 and 53.)* American foreign policy and diplomacy from the adoption of the Constitution to the beginning of World War II.

264. *American Foreign Policy and Diplomacy, 1941 to the Present.* 3 hr. *(Assumes some knowledge of the period such as that obtained in Hist. 2, 53, or 161.)* America's foreign policy and growing involvement in international relations including the U.S. role in World War II, the Korean War, and Vietnam.

266. *American Economic History to 1865.* 3 hr. Origins and development of American business, agricultural, and labor institutions problems, and policies, from 1600 to 1865; influence of economic factors upon American history during this period.

267. *American Economic History Since 1865.* 3 hr. Scope similar to that stated for Hist. 266.

268. *The Old South.* 3 hr. *(For advanced undergraduate and graduate students.)* History of the South—exploring peculiar differences that led to an attempt to establish a separate nation. The geographical limitation permits a detailed study of economic and social forces within the context of the larger national history.

269. *The New South.* 3 hr. Integration of the South into the nation after the Civil War. Emphasis on southern attitudes toward industrialization, commercial agriculture, organized labor, and the black. Special attention to the southern literary renaissance and conservative and progressive politics of the southern people.

274. *The City in American History.* 3 hr. A survey of urban history in the United States, including the colonial period, with emphasis on the nineteenth and twentieth centuries, focusing on physical development of cities (planning, transportation, artchitecture, suburbanization) and social history.

290. *Introduction to Historical Research.* 3 hr. PR: History major or consent. Introduction to research techniques useful for history. Instruction in locating sources, taking notes, and writing research papers.

Program in the History of Science and Technology

Degree Conferred: No degree conferred.
Contact: Emory L. Kemp, *Coordinator*, 293-3867
G-14 Woodurn Hall

Faculty

Emory L. Kemp, Ph.D. (U. Ill.)—*Coordinator and Professor of the History of Science and Technology*. History of technology, Industrial archeology, 19th century engineering.
Gregory A. Good, Ph.D. (U. Toronto)—*Assistant Professor of the History of Science and Technology*. History of science, 18th-20th century in England and America.
Stephen C. McCluskey, Ph.D. (U. Wisc.)—*Associate Professor of History*. History of science, Physical sciences in the medieval and early modern eras.

Nature of Program

The College of Arts and Sciences and the Department of History at WVU have established a curriculum in the History of Science and Technology to stimulate the development of a more comprehensive and integrated approach to liberal education and to encourage wider use of the intellectual and technical resources available within the University. At the undergraduate level, there are introductory and upper-division courses in the history of science and technology. (See course listings in History.)

Program in the Humanities

Degree Conferred: No degree conferred.
Contact: Henry L. Ruf, *Coordinator*, 293-3641
252 Stansbury Hall

Faculty

Professor

Henry L. Ruf, Ph.D. (Emory U.), *Coordinator*.

Lecturers

Janet Kemp, Ph.D. (WVU).
Marcia Stewart, M.A. (Syracuse U.).
Carol Wilcox, Ph.D. (Clark U.).

Nature of Program

The study of humanities consists of the study of mankind's effort to understand itself and to give cultural expression to its self-understanding in literature, religion, philosophy and fine arts. It also consists of our effort to come in dialogue with the masterpieces of the past and present as we personally seek to deepen our understanding of ourselves and our culture: what we are, why we are, what our options for significant life are.

Courses of Instruction in Humanities (Hum.)

Lower Division

1, 2. *Introduction to the Course of Western Civilization*. I, II. 3 hr. per sem. First semester treats the high points of Greco-Roman and Medieval European civilizations: their art, architecture, philosophy, religion, literature, and culture. Second semester shows how these ideas and achievements were modified and added to during the Renaissance, the Age of Classicism, and the revolutionary nineteenth century.

3, 4. *Honors Seminar in Humanities.* I, II. 3 hr. per sem. Honors courses for selected students mirroring Hum. 1 and 2, respectively. Affords participants a wider opportunity for discussion than in Hum. 1 and 2 and for reading the classic statements on the nature of civilization.

5. *Cultures of China and Japan.* I, II. 3 hr. An elementary course that introduces students to the intellectual, artistic, and literary cultures and civilizations of China and Japan as they existed in their social settings.

10. *The Classic Forms of the Hero in Western Civilization.* I. 3 hr. Courage and the classic forms of the hero in the twentieth century. Historical study of art, literature, philosophy, and religious thought from the Greek classics to contemporary novels and films. (Two lectures, one discussion per week.)

11. *The Figure of the Absurd Hero in Western Civilization.* II. 3 hr. Courage and the figure of the "absurd hero" in the twentieth century. Historical study of literature, art, religion, and philosophy from the New Testament to contemporary novels and films. (Two lectures, one discussion per week.)

Upper Division

191. *Special Topics.* I or II. 3 hr.

290. *Special Topics.* I or II. 3 hr.

Individualized Major Program

See Interdepartmental Majors, pages 95–101.

International Studies

Degree Conferred: B.A.
Contact:
Sophia Peterson, *Coordinator*, 293-7140
Rodger D. Yeager, *Adviser*, 293-3811
316 Woodburn Hall

Committee for Interdepartmental Major in International Studies

Sophia Peterson, Ph.D. (UCLA), *Coordinator, Professor of Political Science.*
Vance Q. Alvis, Ph.D. (U. Va.), *Professor of Economics.*
Kenneth C. Martis, Ph.D. (U. Mich.), *Associate Professor of Geography.*
Aaron M. Podolefsky, Ph.D. (SUNY—Stony Brook), *Associate Professor of Anthropology.*
Joseph Renahan, M.S. (Yeshiva U.), *Associate Professor of Foreign Languages.*
John C. Super, Ph.D. (UCLA), *Associate Professor of History.*
Rodger D. Yeager, Ph.D. (Syracuse U.), *Associate Professor of Political Science.*

Nature of Program

The Bachelor of Arts Interdepartmental Major in International Studies is designed to provide a knowledge of global affairs, to help develop understanding and appreciation of other cultures and societies, and to promote informed analysis of world interdependence. It provides the basis for careers in many areas, e.g., international business and commerce, international administration and service, as well as government, law, and research.

Admission Requirements

Admission to the degree program may be applied for upon the completion of 58 hours with a cumulative average of at least 2.0.

Degree Requirements

The International Studies major consists of courses drawn from many departments and Multidisciplinary Study courses. The program is comprised of four parts:

1. Orientation to International Studies (1 hour).

2. Introductory Core (15 hours)—Majors are required to take Economics 54 (Microeconomics) and Economics 55 (Macroeconomics), and three more courses from the following: FLIT 13-18; Geography 1, 7, 8; History 2, 4, 5, 6; Humanities 5; Multidisciplinary Studies 90; Political Science 3; Sociology/Anthropology 5, 51.

3. Advanced Core (12 hours)—The Advanced Core provides students with a more thorough understanding of global institutions, practices, and processes. Majors are required to take four courses from the following:

Econ. 110—*Comparative Economic Systems.*
Econ. 250—*International Economics.*
Geog. 202—*Political Geography.*
Pol. S. 150—*Comparative Politics.*
Pol. S. 160—*International Relations.*

4. Area of Concentration (24 hours). Majors are required to select an Area of Concentration for specialization. This might be a world region (such as Africa and the Middle East, East Asia, Latin America, East Europe, West Europe), or a topical area such as Development Studies. No more than 12 hours out of the required 24 may be taken in the same department. Students select from a variety of courses in economics, foreign languages, geography, history, music, philosophy, political science, religious studies, sociology and anthropology, and technology education.

Options: Internships and Study Abroad

Students are encouraged to take advantage of opportunities for internships and Study Abroad which may be undertaken for academic credit with the approval of the International Studies Adviser. Through internships students gain first-hand knowledge of government agencies or private and business organizations involved in world affairs. To experience another society and/or improve their foreign language competence students may study abroad for a summer or a semester.

Interested students should contact the International Studies Adviser in the Department of Political Science.

Liberal Arts Major

See Interdepartmental Majors, page 101.

Library Science

Degree Conferred: None
Contact:
Barbara Mertins, *Adviser*, 293-3540
Department is in Room 101, Charles C. Wise, Jr. Library.

Faculty

Associate Professors

Elizabeth F. Howard, Ph.D. (U. Pitt). Children's and young adults' literature, School librarianship.

Victorine Louistall Monroe, M.A.L.S. (WVU)—*Emerita.*
Harold B. Shill, Ph.D. (U. N.C.). Social science bibliography, Scholarly communication.

Assistant Professors
Harold M. Forbes, M.L.S. (U. Pitt). West Virginia historical bibliography.
Stokely B. Gribble, M.S.L.S. (U. Ky.). History of books and printing.
Clifford C. Hamrick, M.L.S. (Rutgers U.). Reference, Bibliography.
Theodore M. Judy, M.A.L.S. (WVU). Science bibliography.
Evelyn M. Kocher, M.S.L.S. (U. N.C.). Cataloging and classification.
Barbara Mertins, M.S.L.S. (Syracuse U.). Biblilographic instruction, Children's literature, School librarianship.
Mildred I. Moyers, M.S.L.S. (Case West. Res. U.). Bibliography, Serials librarianship.

Nature of Program

The Department of Library Science has two emphases: (1) Courses are offered for all students to help them to make effective use of the library and to acquaint them with major sources of information in their particular fields; and (2) Courses are available for students in elementary or secondary education who desire to qualify for certification as school library media specialists.

Courses of Instruction in Library Science (L. Sci.)

Lower Division

1. *Using Books and Libraries.* I, II. 1 hr. Provides a working knowledge of library facilities, particularly of the University Library. Includes how and when to use basic reference sources and search strategy for term-paper preparation. Useful to any student in the University.

Upper Division

191. *Special Topics.* I, II. 1-4 hr. PR: Consent.

201.* *Reference and Bibliography.* II. 3 hr. Basic reference materials in print and non-print formats (dictionaries, encyclopedias, indexes, yearbooks, computerized data bases, etc.) are studied and evaluated. Emphasizes theory of information seeking and practical experience with materials.

203.* *Literature for Children.* I, II. 3 hr. A survey of children's literature including its historical development as well as current trends. Emphasizes selection, critical evaluation, and utilization of literary materials for developmental, recreational, and curriculum needs. Appropriate media included.

205.* *Young Adult Literature.* I, II. 3 hr. Survey of adolescent literature and other library materials (print and non-print) for junior and senior high school students. *(Course will not be offered in 1986-87.)*

222.* *Field Practice.* I, II. 3 hr. PR: L. Sci. 201, 203, 205, 223, 250. Practical experience in a variety of public, school, and special libraries, and instructional materials centers, under the supervision of experienced librarians and media specialists. Students must complete 100 clock hours.

223.* *Cataloging and Classification.* I. 3 hr. Basic principles and problems of cataloging and classification combined with practical experience in processing the various types of books and materials. Problems peculiar to the teacher-librarian are considered.

*Presently required for School Library Media Certification in West Virginia.

250.* *Managing School Library Media Centers.* I. 3 hr. PR: L. Sci. 201, 203, 205, 223, Ed. P. 260, or consent. Covers planning, organizing, and operating a school library media center. Includes staffing, budgeting, scheduling, public relations, and program design. Stresses the role of the media center in the total educational process. *(Course will not be offered in 1986-87.)*

291. *Advanced Study.* I, II, S. 1-3 hr. *(Course may be repeated for credit only when the content of the course is different.)* Study of current topics related to informational resources or the school media center. A final project will be required.

326. *Bibliography of the Social Sciences.* II. 1-2 hr. Covers bibliographic structure and information sources in psychology, sociology, political science, economics, history, education, and related disciplines. Provides a good working knowledge of information retrieval tools and the ability to use libraries effectively.

Mathematics

Degrees Conferred: B.A., M.S.
Contact:
Alphonse Baartmans, *Chairperson*, 293-2011/2
Caulton L. Irwin, *Associate Chairperson*, 293-2011/2
Offices are in Rooms 202, 208, 209, 218 Eiesland Hall.

Faculty

Professors

Alphonse Baartmans, Ph.D. (Mich. St. U.)—*Chair.* Algebra, Combinatorics, Block designs, Coding theory.
Anand M. Chak, Ph.D. (Lucknow U., India). Analysis, Special functions, Integral transforms.
Allen B. Cunningham, Ph.D. (WVU)—*Emeritus.*
Hannibal A. Davis, Ph.D. (Cornell U.)—*Emeritus.*
James C. Eaves, Ph.D. (U. N.C.)—*Emeritus.*
Jack T. Goodykoontz, Jr., Ph.D. (U. Ky.). General topology.
Henry W. Gould, M.A. (U. Va.). Combinatorics, Number theory, Special functions.
Franz X. Hiergeist, Ph.D. (U. Pitt). Analysis, Computer science.
Caulton L. Irwin, Ph.D. (Emory U.)—*Associate Chair; Associate Director, Energy Research Center.* Variational methods, Optimization, Applied mathematics.
Alonzo F. Johnson, Ed.D. (Okla. St. U.). Mathematics for teachers.
Jin Bai Kim, Ph.D. (VPI&SU). Algebra, Semigroups.
Iland D. Peters, M.S. (WVU). Algebra.
William H. Simons, Ph.D. (Carnegie-Mellon U.). Analysis, Differential equations, Applied mathematics.
Joseph K. Stewart, Ph.D. (WVU)—*Emeritus.*
Marvin L. Vest, Ph.D. (U. Mich.)—*Emeritus.*

Associate Professors

Jean J. Coover, M.A. (WVU)—*Co-Director, Mathematics Learning Center.* College algebra.
Harvey R. Diamond, Ph.D. (MIT). Applied probability.
James E. Dowdy, Ph.D. (Okla. St. U.). Homological algebra.
Harry Gingold, D.Sc. (Israel Inst. Tech.). Differential equations, Perturbation methods, Numerical computational methods.
James H. Lightbourne, Ph.D. (N.C. St. U.). Differential equations.
Michael E. Mays, Ph.D. (Penn St. U.). Number theory.
Betty L. Miller, M.S. (WVU)—*Faculty Secretary.* Calculus.
James E. Miller, Ph.D. (U. Ky.). Complex analysis.
James L. Moseley, Ph.D. (Purdue U.). Partial differential equations.

*Presently required for School Library Media Certification in West Virginia.

Sam B. Nadler, Jr., Ph.D. (U. Ga.). Topology, Functional analysis.
John W. Randolph, Ph.D. (U. Va.). Algebra, Finite groups.
Samuel M. Rankin, III, Ph.D. (Vanderbilt U.). Analysis, Functional analysis, Differential equations.

Assistant Professors

Ian Christie, Ph.D. (Dundee U.). Numerical partial differential equations.
Joy B. Easton, J.D. (WVU). History of mathematics.
Gary Ganser, Ph.D. (Rensselaer Poly. Inst.). Applied mathematics, Fluid mechanics.
Judith C. Hall, M.S. (Harvard U.)—*Co-Director, Mathematics Learning Center.* Pre-college algebra workshop.
Harumi Hattori, Ph.D. (R.P.I.). Differential equations, Continuum mechanics, Numerical analysis.
Yue-kuen Kwok, M.S. (Brown U.). Computation fluid mechanics, Symbolic manipulation codes.
Wilma J. Loudin, M.S. (WVU). Calculus.
John F. Pierce, Ph.D. (U. Calif.). Global analysis, Mathematical physics.
Victor Trutzer, Ph.D. (Carnegie-Mellon U.). Stochastic differential equations, Probability.

Nature of Program

The Department of Mathematics provides a curriculum which contains programs for an undergraduate major in mathematics, for the pre-service elementary and secondary teacher, for the student who is interested in the applications of mathematics to the fields of computer science, statistics, engineering, physical, natural and social science, and business and economics. Also included in the curriculum are courses designed to acquaint the nonscience major with the ideals and objectives of mathematics.

Enrollment in freshman-level mathematics courses is restricted to students who have demonstrated a satisfactory understanding of background material, either in the prerequisite courses specified in this *Catalog* or on the departmental placement examination. The placement test is given during Summer and Fall Orientation for freshman and transfer students, and also during the first week of each academic term. Students who intend to take the placement examination at the beginning of a term notify the Department of Mathematics on or before the day the test is administered.

Students who are registered at WVU may earn credit for a number of mathematics courses by examination. Examinations will be given at two separate times during each semester. Information concerning the regulations pertaining to credit by examination, courses listed, where and when to apply, and time and place of examinations may be obtained from the Arts and Sciences Academic Advising Center.

Admission Requirements

To be admitted to the mathematics degree program, a student must have a 2.0 overall average, and must have completed Math. 16 and Math. 163 with a 2.5 average in all of the required mathematics courses attempted. Math. 163 should be the first upper-division mathematics course taken, and if that course has not been completed a student will be admitted provisionally until it is completed.

Freshmen and sophomores who plan to major in mathematics and who also wish to meet the requirements for certification as secondary teachers of mathematics should plan their programs carefully in order to meet both sets of requirements within the four academic years.

Degree Requirements

Major in Mathematics

The Department of Mathematics requires a minimum of 34 hours of mathematics, 3 hours of statistics, and 3 hours of computer science excluding C.S. 220 for the Bachelor of Arts degree. Pre-calculus courses cannot be counted toward the fulfillment of this requirement.

Required Courses

Ordinarily, the following courses will be required: Math. 15, 16, 17, 18, 141 or 215, 143 or 241, 220, 251 and Stat. 261. However, in certain instances, departmental advisers may approve appropriate substitutions.

Recommended Electives

A computer science elective should be chosen so that the student will achieve programming proficiency. Note that programming skill is a prerequisite for Math. 220. Selection of elective courses should be made in consultation with a departmental adviser and should be based on the student's interests and goals. More detailed information on recommended courses is available in the Department of Mathematics.

Mathematics Learning Center

The Department of Mathematics offers assistance to students in beginning mathematics courses through its Learning Center located in the basement of Eiesland Hall. The Learning Center has two components: the Study Hall and the Tape Center.

The Study Hall is staffed by graduate students, undergraduate assistants, and faculty, and is intended to help students enrolled in Math. 3, 4, 14, 28, 33, 34, and 131.

The Tape Center is an area where students who are having difficulty with fundamental concepts or who have missed a lecture can listen to audiotapes with visual material to receive help. There is help available on tapes for Math. 3, 4, 14, 15, 16, 23, 28, 33, 34, 128, 131, and Stat. 101. Students may also obtain help here with pre-college algebra and geometry.

The Learning Center is open Monday through Friday during the day and some evenings. The specific times are posted at the beginning of each semester.

Courses of Instruction in Mathematics (Math.)

Pre-College

2. *Algebra.* I, II. 3 hr. PR: One year of high school algebra. Covers the material of high school algebra through quadratics. Credits earned in Math. 2 are not counted in the 64 hours required for graduation in pre-baccalaureate programs at Potomac State College. *(Not offered on the Morgantown campus.)*

Lower Division

3. *College Algebra.* I, II. 3 hr. PR: 1½ units algebra or Math. 2, and 1 unit geometry, and satisfactory performance on departmental placement examination. *(Not open to students who have credit for the equivalent of Math. 14.)*

4. *Plane Trigonometry.* I, II. 3 hr. PR: 1½ units of algebra or Math. 2, and 1 unit geometry. *(Not open to students who have credit for the equivalent of Math. 14.)*

11. *Symbolic Logic 2.* I, II, S. 3 hr. PR: Phil. 10. A continuation of Phil. 10, but branching into applications, analogues and alternative systems of logic. Topics include relational predicate logic, identity, definite descriptions; Boolean algebras; switching circuits; modal, many-valued and other alternative logics; philosophical applications. *(Equiv. to Phil. 11.)*

14. *Pre-Calculus Mathematics.* I, II. 4 hr. PR: 2 units algebra and 1 unit geometry, and satisfactory performance on departmental placement test. *(Not open to students who have credit for the equivalent of either Math. 3 or 4.)* A treatment of algebra, analytic geometry, and trigonometry necessary for the study of calculus.

15. *Calculus.* I, II, S. 4 hr. PR: 2 units algebra, 1 unit geometry, ½ unit trigonometry, and satisfactory performance on departmental placement test or Math. 3 and 4 or Math. 14. Introduction to limits, continuity, derivatives, antiderivatives, definite integrals, and applications of the derivative.

16. *Calculus.* I, II, S. 4 hr. PR: Math. 15. Techniques of integration, applications of the definite integral, polar coordinates, indeterminate forms, infinite series.

17. *Applied Mathematics 1.* I, II, S. 4 hr. PR: Math. 16. Introduction to solid analytic geometry, vector algebra, matrix algebra, calculus of several variables.

18. *Applied Mathematics 2.* I, II, S. 4 hr. PR: Math. 17. Ordinary differential equations, LaPlace transforms, partial differential equations, Fourier series, applications.

23. *Introductory Concepts of Mathematics.* I, II. 3 hr. *(Designed for non-science majors who do not need the techniques of mathematics for other course work in their programs.)* Topics in modern mathematics.

28. *Finite Mathematics.* I, II. 3 hr. PR: Two years high school algebra or Math. 3. Logic, sets, partitions, probability theory, vectors, matrices, linear programming and applications in commerce.

33. *Introductory Mathematics for Elementary Teachers.* I, II. 3 hr. PR: 1 unit high school algebra and satisfactory performance on Arithimetic Entrance Test. *(For elementary education majors only.)* Structure of the number systems, techniques of arthimetic computation derived from the properties of the real number system.

34. *Introductory Mathematics for Elementary Teachers.* I, II. 3 hr. PR: Math. 33 and satisfactory performance on Arithimetic Entrance Test. *(For elementary education majors only.)* Techniques of arithmetic computation derived from the properties of the real number system, logic, informal, geometry and the metric system.

Upper Division

113. *Differential Equations.* I, II. 3 hr. PR: Math. 18. Analysis of ordinary differential equations including: existence and uniqueness of solutions; methods of solution; oscillatory, stability and asymptotic properties of solutions; boundary value problems, linear and nonlinear systems. *(Course will not be offered in 1986-87.)*

120. *Discrete Mathematics 1.* I, II. 3 hr. PR: Math. 15 and C.S. 1 or equiv. Graph theory, matrix representations, sets, relations, shortest path, and minimal spanning tree algorithms. Matrix algebra. Finite automata and regular expressions. Queueing theory. Computer applications emphasized. *(Equiv. to C.S. 120.)* (3 hr. lec.)

125. *Theory of Games.* II. 3 hr. PR: Math. 16 or consent. Elements of matrix algebra and probability. Theory of games, including decision theory, linear and dynamic programming, and strategy. *(Course will not be offered in 1986-87.)*

128. *Introduction to Calculus.* I, II. 3 hr. PR: Math. 3 or 14 or consent. *(For students in other disciplines needing calculus for applications.)* Limits of sequences and functions, continuity, derivatives, and integrals of polynomials, rational functions, and exponential and logarithmic functions, partial derivatives, maxima and minima.

131. *Algebra and Geometry for Elementary Teachers.* I, II. 3 hr. PR: Math. 33 and 34 and satisfactory performance on Arithimetic Entrance Test. *(For elementary education majors only.)* Algebra, real numbers and geometry applied to graphing, problem solving, probability and statistics, calculations, and the computer.

133. *Introductory Modern Algebra for Teachers.* II. 3 hr. PR: Calculus or consent. *(Not open to students with credit for Math. 141.)* The basic number systems, decomposition of integers, modular systems, groups, rings, domains, fields, polynomial rings, matrices, vector spaces, linear transformations.

138. *Modern Geometry for Teachers.* I. 3 hr. PR: Math. 16 or consent. *(For prospective high school mathematics teachers.)* Foundations of geometry. Special topics from Euclidean, projective, and non-Euclidean geometries.

141. *Introduction to Algebraic Structures.* I. 3 hr. PR: Math. 163 or consent. A study of groups, rings, and fields together with their substructures, quotients and products, morphisms; the fundamental homomorphism theorems.

143. *Introduction to Linear Algebra.* II. 3 hr. PR: Math. 17. Introduction to vector spaces as an algebraic system. Emphasis on axiomatic development and linear transformations. Examples from geometry and calculus.

161. *Mathematical Logic 1.* I. 3 hr. PR: Phil. 10 or consent. The axiomatic method, "naive," and axiomatic set theory, Russell's Paradox, infinity and uncountability, the "reduction" of mathematics to set theory, introduction to the consistency and completeness of logic, and Godel's proof of the incompleteness of arithmetic. *(Equiv. to Phil. 161.)*

163. *Introduction to the Concepts of Mathematics.* I, II. 3 hr. PR: Math. 16 or consent. Elementary logic, basic theory, relations and functions, equivalence relations and decomposition of sets, order relations, cardinality. Emphasis on learning to prove theorems.

168. *History of Mathematics.* I. 3 hr. PR: Math. 15. Development of mathematics through calculus, with emphasis on mathematical theories and techniques of each period and their historical evolution.

181. *Topology.* II, S. 3 hr. PR: Math. 163 or consent. Introduction to metric and topological spaces. Topics include: continuity, convergence, separation, compactness, and connectedness.

213. *Partial Differential Equations.* II. 3 hr. PR: Math. 113 or consent. Introduces students in mathematics, engineering, and the sciences to methods of applied mathematics. First and second order equations, canonical forms, wave, heat and Laplace's equations, representation of solutions.

215. *Applied Modern Algebra.* II. 3 hr. PR: Consent. Introduction to graph theory, Boolean algebras, monoids, finite-state and Turing machines with applications to computer design, algebraic coding theory and computer language, especially ALGOL.

217. *Applied Mathematical Analysis.* II. 3 hr. PR: Math. 18. The algebra and differential calculus of vectors, solution of the partial differential equations of mathematical physics, and application of functions of a complex variable.

219. *Seminar in Applied Mathematics.* I, II. 1-12 hr.

220. *Numerical Analysis 1.* I, II. 3 hr. PR: Math. 17 and C.S. 120 and a programming language. Computer arithmetic, roots of equations, interpolation, Gaussian Elimination, numerical integration and differentiation. Numerical solution of initial value problems for ordinary differential equations. Least square approximations. *(Equiv. to C.S. 220.)*

221. *Numerical Analysis 2.* II. 3 hr. PR: C.S. 220 or Math. 241 or consent. Solutions of linear systems by direct and iterative methods. Calculation of eigenvalues, eigenvectors, and inverses of matrices. Applications to ordinary and partial differential equations. *(Equiv. to C.S. 221.)*

224. *Mathematics of Compound Interest.* II. 3 hr. PR: Math. 16 or 128. A problem-solving course focusing on the measurement of interest, annuities, amortization schedules, and sinking funds, and the valuation of bonds and other securities.

226. *Mathematical Statistics.* II. 3 hr. PR: Math. 16 or consent. *(Designed for mathematics teachers.)* Frequency distributions, averages, probability, populations, samples, probability distributions, estimations, hypothesis testing. Although no previous knowledge of computer language is assumed, the computer will be used in this course.

228. *Discrete Mathematics 2.* II. 3 hr. PR: Math. 16 and 120 or equiv. Applications of discrete mathematics to computer science. Methods of solving homogeneous and non-homogeneous recurrence relations using generating functions and characteristic equations; digraphs to analyze computer algorithms; graph theory and its ramifications to computer algorithms. *(Equiv. to C.S. 228.)*

231, 232. *Introduction to Mathematics for the Elementary Teacher.* I, II. 3 hr. per sem. PR: Math. 34 or consent. *(Not open to students who have credit for Math. 131.) (For in-service elementary mathematics teachers.)* Systems of numeration; sets, relations, binary operations, the algebraic structure of various number systems; the notions of length, area, and volume; coordinate geometry. *(Courses will not be offered in 1986-87.)*

239. *Elementary Number Theory.* II, S. 3 hr. PR: Math. 16 or 131 or consent. Divisibility, congruences, linear and quadratic diophantine equations, number theoretic functions, and applications of number theory to other areas of mathematics. *(Course will not be offered in 1986-87.)*

241. *Applied Linear Algebra.* I, II, S. 3 hr. PR: Math. 17; Math. 18 or consent. Matrix algebra with emphasis on algorithmic techniques and applications to physical models. Topics include solution of large systems of equations, orthogonal projections and least squares, and eigenvalue problems.

251, 252. *Introduction to Real Analysis.* I, II. 3 hr. per sem. PR: Math. 163 or consent. A study of sequences, convergence, limits, continuity, definite integral, and derivative, differentials, functional dependence, multiple integrals, sequences and series of functions.

255. *Advanced Real Calculus.* S. 3 hr. PR: Math. 18 or consent. Limits, series, metric spaces, uniformity, integrals.

256. *Complex Variables.* II. 3 hr. PR: Math. 18. Complex numbers, functions of a complex variable; analytic functions; the logarithm and related functions; power series; Laurent series and residues; conformal mapping and applications.

269. *Advanced Topics in Mathematics.* I, II, S. 3-9 hr. PR: Consent. An independent but directed study program the content of which is to be mutually agreed upon by the individual student and instructor.

271. *Projective Geometry.* II. 3 hr. PR: Math. 141, 241, or consent. Projective and affine spaces, transformation groups for planes. Introduction to axiomatic plane geometries. *(Course will not be offered in 1986-87.)*

291, 292. *Theory of Probability.* I, II. 3 hr. per sem. PR: Math. 18. Fundamental theorems. Development of density and distribution functions in the discrete and continuous cases. Classical problems and solutions. Moments, characteristics functions, limit theorems. Applications. *(Course will not be offered in 1986-87.)*

Medieval and Renaissance Studies

See Interdepartmental Majors, page 99.

Music

See Interdepartmental Majors, page 99.

Philosophy

Degree Conferred: B.A.
Contact: Henry L. Ruf, *Chairperson*, 293-3641
Department is in 252 Stansbury Hall.

Faculty

Professors

Ralph W. Clark, Ph.D. (U. Colo.). Business ethics, Metaphysics.
Theodore M. Drange, Ph.D. (Cornell U.). Epistemology, Philosophy of science.
William S. Haymond, Ph.D. (St. Louis U.)—*Emeritus.*
Henry L. Ruf, Ph.D. (Emory U.)—*Chair.* Philosophy of language, Comparative philosophy.

Associate Professors

Virginia H. Klenk, Ph.D. (U. Pitt). Logic, Philosophy of mathematics.
Mark R. Wicclair, Ph.D. (Columbia U.). Philosophy of law, Medical ethics.

Assistant Professors

Bill E. Lawson, Ph.D. (U. N.C.). Ethics, Philosophy and black experience.
Dennis M. Lynch, M.A. (U. Pitt). Debate, Critical reasoning.
Roderick M. Stewart, Ph.D. (Syracuse U.)—*Visiting.* Philosophy of science, Contemporary European philosophy.

Lecturer

Patricia S. Long, M.A. (WVU). Logic.

Nature of Program

Philosophy 1 through Phil. 91 are primarily designed for lower-division students as self-contained liberal arts humanities courses. In small lecture-open discussion classes the student is aided to develop skills in thinking and reasoning properly and in asking deeper and deeper questions about some of the most profound and challenging problems confronting the human intellect today. The courses provide an excellent way to break away from high school into the collegiate intellectual atmosphere.

The major in philosophy is designed for students who want to go on into law, theology, journalism, public administration, social work, or business, as well as for those students who want to do graduate work in philosophy. The students gain advanced skills in analysis and argumentation, a thorough knowledge of the philosophical foundations of Western civilization, and advanced awareness of the ethical implications of contemporary life. Often the philosophy major will carry a second major in an allied field.

Degree Requirements

Hours. Majors in philosophy are required to take 30 hours in philosophy including 18 hours of upper-division work. In addition, all majors are required to take a coherent program of 12 hours of upper-division study in courses approved by the major's adviser in one or more areas outside of philosophy which are judged to be most relevant to the student's particular interest in philosophy.

Required Courses. Each major is required to earn at least a C in each of the following courses: Phil. 1 or 10, 20, 108, 120, 171 and must possess at least a C average in all philosophy courses in order to graduate. Majors planning to do graduate work in philosophy are strongly urged to take Phil. 106.

Courses of Instruction in Philosophy (Phil.)

Lower Division

1. *Introduction to Critical Reasoning.* I, II, S. For students who want to improve their ability to recognize fallacious patterns of reasoning in ordinary discourse and to construct acceptable deductive and inductive arguments. Formal proof techniques will be introducted only when absolutely essential.

2. *Historical Introduction to Philosophy.* I, II, S. 3 hr. An introductory survey of the major philosophers and philosophical movements from ancient times to the present.

3. *Introduction to Problems of Philosophy.* I, II. S. 3 hr. The field of philosophy, examining at an elementary level typical problems such as freedom and determinism, the mind-body problem, and the existence of God.

4. *Introduction to Ethics.* I, II, S. 3 hr. An elementary examination of such issues as the way we ought to live, the nature of the best life, the just society and our moral responsibilities. Such major philosophers as Plato, Aristotle, Aquinas, Kant, and Mill will be studied.

5. *Logic for Debate.* I, II, S. 3 hr. An elementary course aimed at teaching students to think on their feet by having them debate in class the current national collegiate debate topic.

10. *Symbolic Logic 1.* I, II, S. 3 hr. An introduction to modern symbolic logic (basically, propositional logic and the predicate calculus) for students who want to acquire the skill to represent symbolically the form of deductive arguments and to test formally for validity.

11. *Symbolic Logic 2.* I, II, S. 3 hr. PR: Phil. 10. Continuation of Phil. 10, but branching into applications, analogues and alternative systems of logic. Topics include relational predicate logic, identity, definite descriptions; Boolean algebras; switching circuits; modal, many-valued and other alternative logics; philosophical applications. *(Equiv. to Math. 11.) (Not offered every year.)*

13. *Current Moral Problems.* I, II. 3 hr. An elementary, philosophical examination of moral issues arising in such areas of current concern as paternalism, abortion, euthanasia, contractual obligations, due process, civil rights, war, economic justice, punishment, and civil disobedience.

15. *Introduction to Aesthetics.* I or II. 3 hr. An elementary examination of philosophical problems associated with the nature of beauty, the nature of the arts, and the justification of aesthetic evaluation.

17. *Philosophy of Games.* I, II, S. 3 hr. Definition of "game"; value of games; games as art, science, profession, symbol, education tool, etc. Game theory: its applications and conceptual periphery. Social aspects of play and leisure.

20. *History of Ancient Philosophy.* I. 3 hr. An introduction to the major philosophies of the Western world from pre-Socrates to Plontinus.

91. *Special Topics.* I or II, S. 3 hr. *(May not be repeated for credit.)* An elementary examination of a philosophical issue, such as skepticism, freedom, alternative philosophies of life, minds and machines, God and immortality or the nature of man. Topics will vary.

Upper Division

103. *Topics in Medieval Philosophy.* I or II. (Alternate Years.) 3 hr. PR: 3 hr. philosophy or history major or consent. Study of selected topics in the major philosophies of the Western world from Augustine to William of Occam.

105. *History of Recent Philosophy.* I or II. 3 hr. PR: 3 hr. philosophy or consent. A critical study of the major Western philosophers and philosophic movements in the nineteenth and early twentieth centuries including post-Kantian idealism, Marxism, Schopenhauer, existentialism, pragmatism, positivism, and neo-realism.

106. *Mathematical Logic 1.* I. 3 hr. PR: Phil. 10 or consent. Axiomatic method, "naive" and axiomatic set theory, Russell's Paradox, infinity and uncountability, "reduction" of mathematics to set theory, introduction to consistency and completeness of logic, Godel's proof of the incompleteness of arithmetic. *(Equiv. to Math. 161.)*

108. *Ethical Theory.* I or II. 3 hr. PR: 3 hr. philosophy or consent. A critical study of the meaning of moral concepts, the problems of rules of moral reasoning, criteria of moral truth, and the nature of moral rights, duties, and obligations.

111. *American Philosophy.* I or II. (Alternate Years.) 3 hr. PR: 3 hr. philosophy or history or English major or consent. A study of the ideas and movements in American philosophical thought from Colonial times to the early twentieth century, including such topics as the American enlightenment, transcendentalism, social Darwinism, idealism, and pragmatism.

113. *Russian Philosophy.* I or II. (Alternate Years.) 3 hr. PR: 3 hr. philosophy or Russian concentrate or consent. A critical, historical study of Russian philosophy from the time of the eighteenth century Russian Socrates (Skovoroda) down to the time of the Russian Marxists (Plekhanov, Boganov, Lenin, and Axelrod.) *(Course will not be offered in 1986-87.)*

120. *History of Modern Philosophy.* II. 3 hr. PR: Phil. 2 or 3 or 20 or consent. A study of selected writings by major philosophers of the Western world from Descartes to Kant.

121. *Existentialism.* I or II. (Alternate Years.) 3 hr. PR: 3 hr. philosophy or literature course in existentialism or consent. Survey of the major existentialist thinkers.

122. *Philosophies of Asia.* I or II. 3 hr. PR: 3 hr. philosophy or consent. A critical, historical examination of the writing of the classic philosophers of India and China.

123. *Philosophy of Religion.* I or II. 3 hr. PR: 3 hr. philosophy or religious studies concentrate or consent. The nature of religious faith, the nature and existence of God, and the grounds of religious conviction.

125. *Philosophy and the Black Experience.* I, II. 3 hr. PR: Sophomore standing or consent. Philosophical examination of the American Black experience and the moral and political rights and obligations of Blacks in the United States.

150. *Social and Political Philosophy.* I or II. 3 hr. PR: 3 hr. philosophy or political science major or consent. Application of moral concepts to questions concerning the individual and the state.

158. *Philosophy of Science.* I or II. 3 hr. PR: 3 hr. philosophy or science major or consent. Philosophical problems associated with the concepts and methodology of science.

159. *Philosophy of the Social Sciences.* I or II. (Alternate Years.) 3 hr. PR: 3 hr. philosophy or major in one of the social sciences or consent. Philosophical problems associated with the concepts and methodology of the social sciences.

166. *Metaphysics.* I or II. (Alternate Years.) 3 hr. PR: Phil. 1, 3, or consent. Traditional problems associated with reality and experience, universals and particulars, causality, space and time, matter and mind, and the nature of the self.

171. *Theory of Knowledge.* I or II. 3 hr. PR: Phil. 1, 10 or 106 or consent. A critical analysis of the concept of knowledge and an examination of various forms of philosophical skepticism (skepticism about perception, memory, introspection, induction).

172. *Philosophy of Law.* I or II. 3 hr. PR: 3 hr. in philosophy or pre-law student or consent. A philosophical, metatheoretical study of legal theorizing, a metaphysical investigation of the presuppositions of legal claims and an application of philosophical ethics to legal practices, concentrating on recent studies by philosophical analysts.

187. *Philosophy of Mind.* I or II. 3 hr. PR: Phil. 3, 21, or psychology major or consent. The nature of mind and its relation to the body. Other minds. Analysis of mental concepts.

190. *Teaching Practicum.* I, II. 3 hr.

195. *Field Experience (Debate).* I, II. 3 hr.

253. *Philosophy of Mathematics.* I or II. (Alternate Years.) 3 hr. PR: Phil. 106 or consent. Contemporary viewpoints in the foundations of mathematics.

283. *Philosophy of History.* I or II. (Alternate Years.) 3 hr. PR: 6 hr. in philosophy or history major or consent. Theoretical problems such as the nature of historical explanation, relativism, and the status of speculative principles of history.

285. *Philosophy of Language.* I or II. 3 hr. PR: 6 hr. in philosophy or linguistic or language major or consent. Philosophical problems concerning the nature of meaning and language.

290. *Directed Studies.* I, II, S. 1-6 hr. *(May be repeated for credit.)* PR: Instructor's written consent. Individually supervised reading, research, and projects.

292. *Advanced Topics in Philosophy.* I or II. 3 hr. PR: 6 hr. in philosophy or consent. Advanced philosophical investigation of selected problems and issues. Topics will vary.

Physics—Astronomy, Physical Science

Degrees Conferred: B.S., M.S., Ph.D.
Contact:
Martin V. Ferer, *Interim Chairperson*, 293-3421
Carl A. Rotter, *Associate Chairperson and Adviser*, 293-3421
Department is in 209 Hodges Hall.

Faculty

Professors

Atam P. Arya, Ph.D. (Penn St. U.). Nuclear spectroscopy.
Bernard R. Cooper, Ph.D. (U. Calif.)—*Claude Worthington Benedum Professor of Physics.* Surface electronic structure, Rare earth magnetism, Theory.
Martin V. Ferer, Ph.D. (U. Ill.)—*Interim Chair.* Phase transitions and critical phenomena, Theory.
Frank A. Franz, Ph.D. (U. Ill.)—*Provost.* Atomic physics, Optical pumping, Experiment.
Oleg Jefimenko, Ph.D. (U. Ore.). Electrostatics, Theory and experiment.
Arnold D. Levine, Ph.D. (Columbia U.). Field theory.
Pedro A. Montano, D.Sc. (Technion). Surface physics, Mossbauer effect, Experiment.
Arthur S. Pavlovic, Ph.D. (Penn St. U.). Magnetic properties of solids, Experiment.
Carl A. Rotter, Ph.D. (Case West. Res. U.)—*Associate Chair.* Neutron scattering, Ultrasonics, Experiment.
Mohindar S. Seehra, Ph.D. (U. Rochester). Magnetic, electronic, optical properties of solids, Experiment.

Richard P. Treat, Ph.D. (U. Calif.). Aerosol physics, Experiment and theory.
William E. Vehse, Ph.D. (Carnegie-Mellon U.)—*Interim Associate Vice President—Academic Affairs and Research*, Optical properties of solids, Experiment.

Associate Professors
Stanley Farr, M.S. (WVU)—*Emeritus.*
Fred M. Goldberg, Ph.D. (U. Mich.). Physics education.
John E. Littleton, Ph.D. (U. Rochester). Astrophysics, Nucleosynthesis, Theory and experiment.
Douglas B. Williamson, Ed.D. (Columbia U.)—*Emeritus.*

Assistant Professors
Boyce H. Grier, Ph.D. (U. Rochester). Neutron scattering, Magnetic properties, Experiment.
John A. Parmentola, Ph.D. (M.I.T.). Nuclear chromodynamics, Theory.
David L. Price, Ph.D. (U. Minn.)—*Visiting.* Surface physics, Theory.
Timothy J. Schwob, Ed.D. (U. N. Colo.)—*Visiting.* Physics education.

Lecturer
Pauline Arya, B.S. (U. Toledo). Nuclear spectroscopy.

Nature of Program

The degree of Bachelor of Science (B.S. in Physics) is designed to lay a strong foundation for the professional training of physicists, engineers, and other scientists. The degree is intended for students who want to qualify for professional positions in industry, education, medicine, and government as well as for those who plan to do graduate work in physics, engineering, or related areas.

The courses offered in physics are designed to meet the needs of students majoring in areas where a background in physics is desirable. The department also offers courses of interest and value to a broad range of students in areas of general physics, education, astronomy, meteorology, health sciences, and the fine arts.

The courses offered in Physical Science are designed especially for the nonscience major. The Introductory courses (Physics 1, 2) are intended for majors in elementary education. The Guided Design courses (Physics 11, 12) are intended for fulfillment of Core C requirements.

Admission Requirements

Admission to the Bachelor of Science in Physics program requires, in addition to college requirements, that the student have at least a 2.5 grade-point average in all required physics and mathematics courses (which must include Phys. 11, Phys. 12, Math. 15, Math. 16 or their equivalents).

Degree Requirements

A minimum of 136 hours is required for the B.S. degree. Included are: 30 hours of University requirements (English 1, 2; Core); 15 hours of College of Arts and Sciences requirements (Fine Arts; Language); and 70 hours in Departmental requirements (43 in Physics, 8 in Science, 19 in Mathematics). Continuance in the program requires that the student maintain at least a cumulative 2.2 grade-point average in all physics and mathematics courses. Specific course requirements are: in physics—Orientation 1 (Physics Section), Phys. 11, 12, 124, 231, 233, 234, 241, 251, 263, 271, 283, and 6 hours electives; in mathematics—Math. 15, 16, 17, 18, and 3 hours elective; in science—8 hours from biology, chemistry, and/or geology.

Students have about 21 hours of unrestricted electives which can be used to prepare for entry into a professional school (engineering, medicine, law, etc.). Early departmental advising is recommended in setting up a well-planned program

Options

Qualified students with a cumulative grade-point average of at least 3.0 in physics courses may obtain a B.S. in Physics with Honors by carrying out a physics-related project in addition to the required courses. The project results in the form of a written report must be approved by a committee composed of three faculty members chosen by the student, at least two of whom are from the Department of Physics. Students should register for at least 2 hours of credit in the honors section in Physics 201. The undergraduate adviser serves as the department director for the Honors Program.

Courses of Instruction in Physics (Phys.)

Lower Division

1. *Introductory Physics.* I, II. 4 hr. PR: Trigonometry and college algebra. The fundamental philosophy and principles of physics are applied to studies of mechanics, sound, heat, and thermodynamics through demonstrations, problems, and experiments.

2. *Introductory Physics.* I, II. 4 hr. PR: Phys. 1. The fundamental philosophy and principles of physics are applied to studies of electricity, magnetism, optics, light, and atomic and nuclear physics through demonstrations, problems, and experiments.

7. *Physics of Music.* I. 3 hr. *(For students of the liberal and fine arts as well as science and engineering majors.) (No science or music prerequisites.)* The physical and psychophysical principles underlying the nature, production, transmission, reception, and reproduction of sound.

8. *Light, Vision, and Color.* II. 3 hr. *(For students in liberal and fine arts.)* Descriptive course emphasizing the basic principles of light with applications to color vision, and optical phenomena occurring in everyday environment and technology.

11. *General Physics.* I, II. 4 hr. PR: A grade of C or better in Math. 15. *(Not open to students who have credit for Phys. 1.)* Survey of classical mechanics, thermodynamics, and waves.

12. *General Physics.* I, II. 4 hr. PR: Phys. 11. *(Not open to students who have credit for Phys. 2.)* Survey of electricity, magnetism, and optics.

Upper Division

117. *Descriptive Meteorology.* II. 3 hr. PR: 1 year college physics or physical science. The atmosphere and its weather. Reading and analysis of weather maps. Weather observations. Special topics of current or particular interest.

124. *Elementary Modern Physics.* II. 4 hr. PR: Phys. 12, Math. 16. Topics of modern physics of interest to science majors and engineers; atomic and molecular structure and spectra, solid state and nuclear physics, relativity, and elementary particles.

201. *Special Topics.* I, II. 1-6 hr. per sem. *(May be repeated to max. of 24 hours.)* Study of topics of current interest in physics.

225. *Atomic Physics.* I, II. 3 hr. PR: Phys. 124 or equiv. Relativistic mechanics, atomic structure, and spectra.

231, 232. *Theoretical Mechanics.* I, II. 3 hr. per sem. PR: Phys. 11, 12 or equiv.; Conc.: Math. 18. Scalar, vector, and tensor fields; curvilinear coordinate systems. Kinematics and dynamics of particles, systems of particles and rigid bodies. Lagrangian and Hamiltonian formulation. Relativistic motion.

233, 234. *Electricity, Magnetism, and Radiation Optics.* I, II. 3 hr. per sem. PR: Phys. 11, 12 or equiv.; Conc.: Math. 18. Electrostatics, magnetostatics, introduction to electrodynamics, and applications to optics.

241. *Advanced Physics Laboratory.* I, II. 1-2 hr. per sem. PR: Phys. 11, 12, 124. Experiments in physics designed to implement theory courses, give experience in data taking and instrumentation, and learn methods of data evaluation and error analysis.

248. *Physics Seminar.* I, II. (No Credit.) *(Suggested for junior, senior, and graduate Physics majors.)* These lectures acquaint students with topics of current interest in physics.

251. *Introductory Quantum Mechanics.* I. 3 hr. PR: Phys. 124, Math. 18. Fundamental principles of quantum mechanics; state functions in position and momentum space, operators, Schrodinger's equation, applications to one-dimensional problems, approximation methods, the hydrogen atom, angular momentum and spin.

263. *Nuclear Physics.* I, II. 3 hr. PR: Phys. 124; Math. 17. Study of characteristic properties of nuclei and their structure as inferred from nuclear decays and reactions, leading to a knowledge of nuclear forces and models.

271. *Solid State Physics.* I, II. 3 hr. PR: Phys. 124 or equiv.; Math. 17. Properties of crystalline solids; includes crystal structure, interatomic binding, lattice vibrations, electron theory of metals, and the band theory of solids with some applications.

283. *Thermodynamics.* II. 3 hr. PR: Phys. 11, 12 or equiv.; Math. 17. Introduction to the statistical foundations of thermodynamics. Application of the fundamental laws of thermodynamics to physical and chemical systems.

301. *Special Topics.* I, II. 1-6 hr. per sem. *(May be repeated to max. of 24 hours.)* PR: Consent. *(Primarily for Graduate students.)* Specialized topics of current interest in physics.

313. *Introductory Electronics.* S. 3 hr. PR: 1 year college physics. *(Primarily for Education majors; not open to Physics majors.)* Principles and applications of electrical components and circuits, including solid-state electronics.

321. *Optics.* I, II. 3 hr. PR: Phys. 11, 12 or equiv.; Math. 17. A basic course in physical optics covering radiation theory, diffraction, interference, polychromatic waves, scattering, polarization, double refraction, and selected topics in quantum optics.

325. *Advanced Atomic and Molecular Physics.* I. 3 hr. PR: Phys. 351. Advanced quantum theory of atoms and molecules. Detailed treatment of group theoretical background necessary for treating symmetry considerations in quantum mechanics.

331. *Advanced Classical Mechanics.* I. 3 hr. PR: Phys. 231, 232, and differential equations. Lagrange and Hamilton form of equations of motion, rigid bodies, small and nonlinear oscillations. Transformation theory, relativistic dynamics, and systems with an infinite number of degrees of freedom.

333, 334. *Advanced Electricity and Magnetism.* I, II. 3 hr. per sem. PR: Phys. 233, 234, and differential equations. Electrostatic and magnetostatic boundary value problems. Maxwell's equations for time varying fields. Green's functions and integral responsibilities; applications to radiation, diffraction, wave guides, plasma physics, and relativistic motion of charged particles.

351, 352. *Quantum Mechanics.* I, II. 3 hr. per sem. PR: Phys. 251. Covers a wide range of topics of current interest at a level such that a student should be able to read basic research papers in many fields upon completion. Topics covered include: approximation methods, representation theory, angular momentum, relativistic quantum mechanics, time dependent perturbation theory, identical particles, scattering, molecules, solids, magnetism, and second quantization of bosons and fermions.

354. *Outline of Modern Physics.* S. 3 hr. PR: One year introductory college physics. *(Primarily for Education majors; not open to Physics majors.)* Elementary study of atomic and molecular structures and spectra, solid state and nuclear physics, relativity and elementary particles.

355, 356. *Workshop for Physics Teachers.* S. 3 hr. per sem. PR: One year college physics; one year college mathematics. *(Primarily for Education majors; not open to Physics majors.)* Techniques of apparatus construction and demonstration.

357. *Photography.* SI. 3 hr. PR: One year of college physics or equiv. *(Primarily for Education majors; not open to Physics majors.)* The physics and chemistry of photography with practical experience.

358. *Light.* SII. 3 hr. PR: One year college physics or equiv. *(Primarily for Education majors; not open to Physics majors.)* A demonstration course designed to illustrate the basic concepts covering light and optics.

383. *Statistical Mechanics.* II. 3 hr. PR: Phys. 283, 352. Ensemble theory, applications to noninteracting systems, as well as perturbative and approximate treatment of interactions. Typical applications include equilibrium constants, polymers, white dwarves, metals, superfluids, magnetic transitions.

387. *Mathematics for Physicists and Engineers.* I. 3 hr. PR: Calculus, differential equations, Phys. 11, 12 or equiv. Complex variables: series, contour integration and conformal mapping; ordinary differential equations; Fourier Series; Laplace transforms, Fourier transforms; special functions; Bessel functions and Legendre, Hermite, and Laguerre polynomials; introduction to partial differential equations; Poisson's equation, Wave equation, and diffusion equation.

388. *Mathematics for Physicists and Engineers.* II. 3 hr. PR: Calculus, differential equations, Phys. 11, 12 or equiv. Vector spaces, tensor calculus, group theory, integral equations, calculus of variations, nonlinear systems and other topics as time permits.

Courses of Instruction in Astronomy (Astro.)

Upper Division

106. *Descriptive Astronomy.* I, II. 3 hr. The celestial sphere, star time, solar time, Kepler's laws, H-R diagram and modern developments. No sophisticated mathematics used; only simple geometrical arguments employed.

216. *Astronomy for Teachers.* S. 3 hr. PR: Consent. Basic concepts and methods in astronomy and how to teach them using the celestial sphere and geometrical tools. Observational work at night. The use of a telescope and camera.

255. *Intermediate Astronomy.* II. 3 hr. PR: Math. 16 or consent. Measurement of the universe; trigonometric parallax, statistical parallax, moving clusters, cluster H-R diagrams, masses of various binary systems, Kepler's Laws, and the three-body problem.

Courses of Instruction in Physical Science (P. Sci.)

Two sequences of introductory-level laboratory courses are designed especially for the nonscience major.

P. Sci. 1, 2 help students develop inquiry skills in science. During class, students work in pairs doing activities, performing simple experiments, and

solving problems. There is a significant amount of discussion between the instructor and individual students. This approach would be particularly beneficial for students preparing to teach because it will help develop confidence in teaching science. There are four hours of laboratory-discussion and one hour of lecture-discussion each week.

P. Sci. 11, 12 are particularly suitable as general education science courses. The guided design approach teaches students skills that will help them make decisions concerning environmental and other science-related issues and problems that the students will face as citizens. When focusing on the open-ended problems, students work in small groups and are guided in their discussions by instruction and feedback materials. There are three hours of lecture-discussion and two hours of laboratory-discussion each week.

Lower Division

1. *Introductory Physical Science.* I, II. 4 hr. *(For elementary education majors only.)* Emphasis on practicing reasoning abilities necessary to carry out simple scientific inquiry. Major concepts include properties of matter and astronomy. Majority of class time is spent in laboratory activities and solving problems using an activity-based approach.

2. *Introductory Physical Science.* I, II. 4 hr. PR: P. Sci. 1. Continuation of P. Sci. 1. Concepts include electricity, motion, heat and temperature, energy, and chemistry.

11. *Guided Design Physical Science.* I. 4 hr. *(Strongly recommended for freshman and sophomores only.)* Emphasis on learning physics and astronomy and science laboratory skills in the context of solving open-ended, science-related problems, such as the energy crisis, and searching for extraterrestrial intelligence.

12. *Guided Design Physical Science.* II. 4 hr. PR: P. Sci. 11. Continuation of P. Sci. 11 with special emphasis on solving environmental problems in chemistry (water pollution), geology (locating a sanitary landfill), and meteorology.

Upper Division

190. *Teaching Practicum in Physical Science.* I, II. 1-3 hr. per sem. PR: P. Sci. 1 and 2 and consent. Opportunity to help teach an activity-based science course under the direction of experienced instructors. Emphasis on developing inquiry teaching skills useful for all levels of classroom instruction.

Political Science

Degrees Conferred: B.A., M.A., Ph.D.
Contact:
Allan S. Hammock, *Chairperson*, 293-3198
Robert E. DiClerico, *Associate Chairperson; Director of Undergraduate Studies*, 293-3198
Department is in 316 Woodburn Hall.

Faculty

Professors

David A. Bingham, Ph.D. (U. Iowa). State and local government, Intergovernmental relations.
Orrin B. Conaway, Jr., Ph.D. (Syracuse U.)—*Emeritus.*
Carl Frasure, Ph.D. (Ohio St. U.)—*Emeritus.*
Hong N. Kim, Ph.D. (Georgetown U.). Comparative politics (Asia).
Herman Mertins, Jr., Ph.D. (Syracuse U.)—*Adjunct.* Public administration.

Sophia L. Peterson, Ph.D. (UCLA). International relations, Public policy (women and politics).
Gerald Pops, Ph.D. (Syracuse U.)—*Adjunct.* Public administration.
George W. Rice, Ph.D. (Ohio St. U.). International relations, Comparative politics (Eastern Europe, Middle East).
Irvin Stewart, Ph.D. (Columbia U.)—*President Emeritus.*
David G. Temple, Ph.D. (U. Va.). State and local government, Urban politics.
James B. Whisker, Ph.D. (U. Md.). Political theory, American government.
Herbert G. Wilcox, Ph.D. (NYU). Nuclear politics, Comparative bureaucracy, Public administration.
David G. Williams, Ph.D. (SUNY—Albany)—*Adjunct.* Public administration.

Associate Professors

Robert E. DiClerico, Ph.D. (Ind. U.). American government, Presidency, Parties and electoral processes, Public policy (agenda setting).
Allan H. Hammock, Ph.D. (U. Va.)—*Chair.* American government, Public policy (civil rights, health care).
David M. Hedge, Ph.D. (U. Wisc.). Methodology, Legislative politics, Public policy (energy and environment).
Nand Hart-Nibbrig, Ph.D. (U. Calif.)—*Adjunct.* Public administration.
John A. Jacobsohn, Ph.D. (U. Md.). International relations, Comparative politics (Latin America).
Joseph Stewart, Jr., Ph.D. (U. Houston). Public policy (implementation, civil rights, American policy process).
Harvey Wolf, D.P.A. (U. So. Calif.)—*Adjunct.* Public administration.
Rodger D. Yeager, Ph.D. (Syracuse U.). Comparative politics (Africa, Political development).

Assistant Professors

Marion F. Dearnley, J.D. (SUNY—Buffalo)—*Adjunct.* Women and politics.
D. Lyn Dotson, J.D. (WVU)—*Adjunct.* American government.
Robert D. Duval, Ph.D. (Fla. St. U.). Methodology, Public policy (energy), International politics and policy.
J. Patrick Hagan, Ph.D. (U. N.C.). Public law, Judicial politics, Public policy (criminal justice, civil liberties).
Michael J. Scicchitano, Ph.D. (U. Ga.). Methodology, Public administration, Public policy, Campaigns and elections.
Max O. Stephenson, Ph.D. (U. Va.)—*Adjunct.* Public administration.
David J. Webber, Ph.D. (Ind. U.). Public policy (environment economic), Policy analysis.

Nature of Program

The undergraduate curriculum in the Department of Political Science is designed to achieve five main objectives. These are:

1. To acquaint students with the nature and role of government in modern society, thus contributing to the general education of the student. In order to achieve this objective, the department offers the *General Political Science Track.* This track is open to any student who has a general interest in political science but who has not yet focused on a specific career goal.

2. To impart a basic knowledge and understanding of the public policy making process, including the techniques used by policy analysts and public administrators. To accomplish this objective, the department offers the *Public Policy and Administration Track.* Students having a desire to work in government and/or to obtain an advanced graduate degree in Public Policy Studies or Public Administration at WVU, or elsewhere, should enroll in this track. Additional information on the Public Administration and Public Policy

M.A., M.P.A., or Ph.D. programs at WVU may be obtained in the *WVU Graduate Catalog*.

3. To provide pre-professional training for students preparing to enter the legal profession. Students interested in legal careers should enroll in the *Legal Studies Track*.

4. To develop an understanding of the international and global dimensions of world and national politics. Students who wish to concentrate their course work in international relations and foreign affairs as preparation for careers in this area should enroll in the *International Affairs Track*.

5. To provide pre-professional training for students who intend to pursue political science as a career. Those who intend to be teachers, researchers, or administrators should plan to enroll in graduate school after completing their bachelor's degree. The professional political scientist who intends to teach or do applied research in *public policy* should take the *Public Policy and Administration Track*. This track will prepare students for the M.A. and Ph.D. in Public Policy Studies or the M.P.A. in Public Administration.

Admission Requirements

Students may apply for admission to the Department of Political Science after completing 58 credit hours with a cumulative grade-point average (GPA) of 2.1 or better. In addition, students must maintain a cumulative grade-point average of 2.0 in order to remain a political science major. Students nornally apply for admission the second semester of their sophomore year. Upon admission, each student will be assigned a faculty adviser in the Department of Political Science. Pre-political science majors should enroll in the special orientation class "Orientation to Careers in Law, Politics and Political Science" which is designed to introduce freshmen and sophomores to the faculty, academic requirements and career opportunities in political science.

Degree Requirements

A 2.0 grade-point average is required for graduation. Also, no major with an incomplete in a political science course will be certified for graduation.

1. Students majoring in political science must take a minimum of 30 upper-division hours in political science. At least one course must be selected from each of the following fields:

American Government and Politics: Pol. S. 110, 111, 112, 120, 210, 211, 212, 213, 214, 221, 225, 226, 310.

Public Policy and Administration: Pol. S. 130, 140, 137, 231, 233, 236, 238, 240, 242, 244, 330, 331, 336.

Comparative Government and Politics: Pol. S. 151, 250, 251, 252, 253, 254, 255, 256, 258, 259, 355.

International Relations: Pol. S. 160, 261, 262, 263, 264, 266, 267, 268, 269, 360.

Political Theory: Pol. S. 270, 271, 272, 273, 275, 279.

2. The department also offers three courses that deal with the scope of political science and the various techniques employed by political scientists to investigate and analyze political data: Pol. S. 100, 200, and 300. Pol. S. 100 is required of all majors. Pol. S. 200 is offered to undergraduate and graduate students. Pol. S. 300, while designed for graduate students, may be taken by advanced undergraduates. All three courses count toward the 30 hours required of political science majors.

3. Students may also arrange to take selected special courses dealing with a special topic or involving experiential learning. These courses are scheduled on both a group and tutorial basis with individual faculty members. Courses available for this type of instruction are: Pol. S. 188, 189, 191, 194, 196, and 299. These courses also count toward the 30 hours required in political science. However, no more than 6 hours of Pol. S. 194, *Field Experience*, may count toward the 30-hour requirement.

4. With the exception of the Legal Studies Track, all political science majors must take 12 hours in a minor field. The choice of a minor field depends on the interest of the student and the particular track in which the student is enrolled. Minor fields available include: economics, geography, history, philosophy, psychology, sociology and anthropology, statistics and/or computer science, accounting, business, civil engineering, English, industrial engineering, journalism, social work, speech communication, mathematics, foreign languages, and inter-departmental minor.

5. *Students having a grade of I (Incomplete) in any political science course must remove the incomplete before departmental certification for graduation.*

6. All majors are required to take Econ. 54 and 55 and Pol. S. 100. It is also recommended, though not required, that majors take Pol. S. 1, 2, 3, and 7 in preparation for upper-division political science courses.

Track Options

Each political science major must enroll in a political science track, depending on his or her academic or career interest. The tracks and the individual requirements of each are:

General Political Science Track (General Liberal Arts). Students selecting the General Track are expected to take courses that expose them to the full range of the discipline of political science and the other social sciences. *Required:* Pol. S. 100; Econ. 54 and 55; 30 upper-division hours in political science courses; and 12 upper-division hours in a minor field. *Recommended:* Pol. S. 1, 2, 3, 7, 200, and elective courses in sociology, anthropology, psychology, philosophy, geography, history, and economics.

Public Policy and Administration Track (Public Service Careers). Students enrolling in the Public Policy and Administration Track take courses that prepare them for work in government, non-profit organizations, and selected private companies. This track emphasizes training in public policy analysis, public administration, selected policy issues (such as energy, environment, and civil rights), and statistical techniques. *Required:* Pol. S. 100, 120, 130, 140; Econ. 54 and 55; 6 hours from policy courses—Pol. S. 137, 231, 233, 236, 238; and 12 upper-division hours in a policy field or selected minor. *Recommended:* Pol. S. 1, 2, 200; Stat. 101; C.S. 5.

Legal Studies Track (Careers in Law). Students selecting the Legal Studies option are required to take a variety of substantive and skills courses which are recognized as valuable background for the study of law. This specialized curriculum is drawn from several departments, including Political Science, Economics, English, Philosophy, Statistics, Accounting, Sociology, and Psychology. *Required:* Pol. S. 100; Econ. 54 and 55; 6 hours (2 courses) from the following law-related courses in Political Science—Pol. S. 110, 212, 213, 214, 244, 263, 275; 9 hours (3 courses) from the following skills courses—C.S. 5, Accntg. 51 and 52, English 108, Stat. 101, Phil. 1, 5, Econ. 125; and 9 hours (3 courses) from the following substantive courses in law-related

disciplines—Soc. & A. 102, 132, and 200, Phil. 272, Econ. 241 and 245, Psych. 151. *Recommended:* Pol. S. 1 and 2.

International Affairs Track (Careers in International Affairs). Students choosing the International Affairs Track specialize in several main fields of study within the discipline of political science, including international relations, foreign policy analysis, and foreign and comparative governments. This track is one of two options available to students interested in international relations. The Department of Political Science, in cooperation with other departments, also offers the Interdepartmental Major in International Studies which is headed by a faculty member in the Department of Political Science. The *Interdepartmental Major in International Studies* offers an extensive treatment of international affairs from the perspective of a variety of disciplines. The *International Affairs Track*, on the other hand, is offered exclusively by the Department of Political Science. *Required:* Pol. S. 100, 150, and 160; Econ. 54 and 55; 6 hours (2 courses) from the following courses dealing with international relations—Pol. S. 261, 262, 263, 264, 266, 267; 3 hours (1 course) which focuses on an industrialized country—Pol. S. 151, 250, 251, 252, 253; 3 hours (1 course) which deals with a developing country—Pol. S. 254, 255, 256, 258, 259; and 12 upper-division hours in a minor field. *Recommended:* Pol. S. 3 and 200; Stat. 101 and C.S. 5.

Honors Program

The Department of Political Science, in cooperation with the University Honors Program, offers courses which are open exclusively to honors students. These courses are listed in the University's *Schedule of Courses* each semester. Students who meet the standards of the University Honors Program may enroll in these courses.

In addition, the Department of Political Science offers honors courses for those who wish to gain departmental honors status. In order to achieve honors in political science a student must: (a) complete at least 15 hours in upper-division political science courses; (b) have a minimum grade-point average of 3.3; and (c) take at least 6 hours in upper-division honors sections of political science courses. Students interested in the Political Science Honors Program should contact the Director of Undergraduate Studies in the Department of Political Science.

Courses of Instruction in Political Science (Pol. S.)

Lower Division

1. *Introduction to Political Science.* I, II, S. 3 hr. Introduction to government. Origins, forms, and functions of the state; organization and forms of government; and the relationships of groups and individuals to the state.

2. *The American Federal System.* I, II. 3 hr. General survey of American national government and politics.

3. *Global Political Issues: An Introduction.* I, II, S. 3 hr. Analyzes significant issues in world politics, e.g., environment, energy, food, population, arms and security, human rights, economic interdependence, and development. It examines the values and policies in conflict, and alternative futures.

7. *Modern Political Ideologies.* I, II. 3 hr. *(Designed especially for nonmajors.)* A survey of some of the major competing ideologies in the modern world, including capitalism, communism, socialism, fascism, and democracy.

Upper Division

100. *Empirical Political Analysis.* I, II, S. 3 hr. Designed to provide a basic understanding of how to read and conduct empirical political science research. Topics include research design, hypotheses testing, data collection, and statistical analysis. No prior knowledge of computers or statistics required.

110. *Law and the Legal System.* I. 3 hr. Introductory course on the role of law in political processes. Attention to the United States context. A survey of subfields in United States law and an examination of participants and processes in the United States legal system.

111. *Political Parties and Electorial Processes.* II. 3 hr. Nature of political parties. Public regulation of parties and electoral processes. A close examination of suffrage, nominating devices, campaign procedures, and the conduct of elections.

120. *State and Local Government.* I, II. 3 hr. The legal basis, structure, politics and operation of state and local governments, their relations with each other, and their place in the federal system.

130. *Introduction to Policy Analysis.* I, II, S. 3 hr. Examination of the causes and consequences of public policies. Substantive policies examined include: civil rights, housing and urban renewal, health, welfare, law enforcement, education, and taxation.

137. *Women and Politics, Policy, and Law.* II. 3 hr. The public policy process concerning gender-related issues. Formation of women's interest groups. Women's political participation and office-holding. National policies as formulated in executive orders, congressional legislation, and court cases. Policy implementation and impact.

140. *Introduction to Public Administration.* I, II. 3 hr. The development, organization, procedures, processes, and human relation factors of governmental administration in American democracy.

150. *Introduction to Comparative Politics.* I, II. 3 hr. An introduction to the political and governmental systems of industrialized and Third World countries. Focuses on approaches to comparative political study, political cultures and participation, and government structures, processes, and policy performance.

151. *Contemporary European Governments.* I, II. 3 hr. Comparative analysis of constitutions, political structures, and functions, with major emphasis on the United Kingdom, France, Russia, and West Germany.

160. *International Relations.* I, II. 3 hr. Contemporary world politics. Background to make present-day international affairs more understandable.

188. *Honors Seminar.* I, II. 3 hr.

189. *Selected Topics (Honors.)* I, II. 3 hr.

191. *Special Topics.* I, II, S. 3 hr. Course topics change. Students may enroll more than once.

194. *Field Experience.* I, II, S. 1-18 hr. *(Total credit applicable toward any Arts and Sciences degree may not exceed the maximum of 18 hours.)* PR: Consent for those who wish to work with faculty and field supervisors to design field experience with planned learning objectives and credit goals.

196. *Seminar.* I, II, S. 1-6 hr.

200. *Quantitative Political Analysis.* I, II. 3 hr. PR: Upper-division standing. Course stresses the understanding of methods, theories, and substantive interests identified with behavioral approach to the study of politics. Descriptive statistics and the use of the University of Chicago's Statistical Package for the Social Sciences (SPSS) are included.

210. *The American Presidency.* I, II. 3 hr. Institutional, behavioral, and societal forces which have given rise to the modern presidency; factors which enhance and constrain the exercise of the presidential power over those constituencies with which the president must interact; the nature and consequences of the presidential decision-making process; desirability and/or feasibility of reforming the presidency.

212. *Judicial Politics.* II. 3 hr. The role of courts and judges in the American political process. Topics include the structure and process of courts, factors involved in judicial decision-making, and the appropriate role of courts in matters of public policy.

213. *American Constitutional Law.* I. 3 hr. The role of the Constitution in the American political system. Topics covered include the political concept of constitutionalism; the role of the Supreme Court in the political process; division of powers among the three branches of government; and the constitutional relation between the national government and the states.

214. *Civil Liberties in the U.S.* I, II. 3 hr. Issues in Constitutional Law concerning personal liberties against government action. Topics include free speech, press and association; religious freedoms; abortion; the right to privacy; due process of law; and criminal procedure safeguards.

218. *The Legislative Process.* II. 3 hr. Structure and organization of legislative bodies, powers of legislature, detailed study of law-making procedures, influences of outside forces.

221. *West Virginia Government and Administration.* I, II. 3 hr. Organization and operation of the state government of West Virginia.

225. *Urban Politics.* I. 3 hr. Legal basis, structure, processes, and politics of urban governments and cooperative-conflict relations with other governmental units.

226. *Problems of State and Local Government.* I, II. 3 hr. PR: Pol. S. 120 or equiv. Change processes in state and local systems in the context of federalism.

232. *Public Opinion and Propaganda.* I, II. 3 hr. In-depth treatment of public opinion, election campaigns, and specific campaign techniques. Emphasis on the forces that shape public opinion; the role of campaign professionals; and the practical aspects of running a campaign.

235. *Civil Rights Policy and Politics.* II. 3 hr. Analysis of the law, politics, and policy related to discrimination in public accommodations, voting, education, housing and employment based on race, gender, national origin, handicapped status, and age.

236. *Energy Policy and Politics.* II. 3 hr. An examination of U.S. energy policies and politics, with particular emphasis placed on the development and implementation of energy policies since 1973.

238. *Politics of Environmental Policy.* I. 3 hr. Examines the formulation and evaluation of United States environmental policy.

240. *Public Administration and Social Change.* I, II. 3 hr. PR: Pol. S. 140. The study of government and administrative organization in their relationships to the sources of change—social, cultural, economic, technical, and environmental—in American society. *(Course will not be offered in 1986-87.)*

242. *American Administrative Systems.* I. 3 hr. Analysis of the nature and processes of American public administration (political, legal, economic, and social conditions), including the role of the bureaucracy in a democracy. *(Equiv. to Pub. A. 242.)*

244. *Administrative Law and Regulation.* II. 3 hr. PR: Pol. S. 140 or consent. The law of public administration, primarily by case method, covering administrative powers and limitations, procedure in administrative adjudication and rule-making, discretion, ultra vires as check on administrators, notice and hearing, administrative penalties, judicial control, and administrative liability.

246. *Comparative Public Administration.* II. 3 hr. Theory and practice of public administration in diverse cultures and national political systems.

250. *Government of Japan.* II. 3 hr. Survey of political institutions and governmental process of Japan with special emphasis on the analysis of political problems in the post-war period.

251. *Governments of Soviet Union and Eastern Europe.* II. 3 hr. Survey of the political nondemocratic governments of the Soviet Union and its Eastern European satellites, with special reference to the guiding role and development of Marxism-Leninism.

252. *British Government and Politics.* II. 3 hr. Intensive study of British government with emphasis on internal and external policies, primarily during the twentieth century.

253. *Contemporary Governments of the Commonwealth.* II. 3 hr. Political relationships between members of the Commonwealth. Comparative study of governments and politics of the dominions, with particular reference to Canada and Australia.

254. *Government of China.* I. 3 hr. Survey of political institutions and governmental process of Communist China with special emphasis on the analysis of political problems since 1949.

255. *Governments of Latin America.* I. 3 hr. Comparative study of the major nations of Latin America.

256. *Governments of the Middle East.* II. 3 hr. Governments and political forces of the Middle East.

258. *Politics of Africa.* II. 3 hr. Historical legacies and current political processes of tropical African countries.

261. *International Organization.* II. 3 hr. Agencies created since the close of World War II. Some reference to the development of international law and United Nations.

262. *Nuclear War.* I, II. 3 hr. PR: Pol. S. 160 or consent. A study of the current balance of terror and the potential threat of a nuclear war. This course addresses the sociopolitical and technological dimensions of this issue from 1945 to present.

263. *Public International Law.* I. 3 hr. Law governing relations among nations, including development of rules, means of enforcement, and conflicts between theory and practice.

264. *Conduct of American Foreign Relations.* I. 3 hr. Concepts about the factors influencing the formation and execution of United States foreign relations; analysis of past policies and current issue areas in relations with major developed and developing nations and international organizations.

266. *Soviet Foreign Policy.* II. 3 hr. Concepts about the factors influencing the formulation and execution of Soviet foreign relations; analysis of past policies and current issue areas in relations with major developed and developing nations and international organizations.

267. *Latin America in International Affairs.* II. 3 hr. Relations of Latin American states among themselves, with the United States, the United Nations, regional organizations, and nonwestern states. Analysis in depth of the Monroe Doctorine and its corollaries and the inter-American system.

269. *Far Eastern International Relations.* II. 3 hr. International relations of Far Eastern countries with emphasis on historic roots of recent conflicts, the competitive role of the United States and the Soviet Union, confrontation between the communist and anti-communist countries in the region, and the regional cooperation and security problems in the post-war period.

270. *History of Political Thought: Plato to Machiavelli.* I. 3 hr. Major political ideas from the Greeks to the sixteenth century with special emphasis upon development of natural law and the western conception of justice.

271. *History of Political Thought: Machiavelli to Bentham.* II. 3 hr. PR: Pol. S. 270 or consent. Political ideas which developed from the separation of faith and reason, the culmination of this movement in rational integral liberalism, and the origins of modern conservatism as expounded by Edmund Burke.

272. *Recent and Contemporary Political Thought.* I. 3 hr. Examination of intergral liberalism and the forces leading to the decline of liberalism and a critical analysis of the fascist and communist ideologies with their threat to the traditions of western civilization embodied in Christianity and conservatism.

273. *American Political Theory.* I, II. 3 hr. Major political ideas and their influence upon American society and government from the seventeenth century to the present.

275. *Foundations of Jurisprudence.* II. 3 hr. Nature, substance, and purpose of the law as determined by the major schools of the philosophy of the law.

279. *Analysis of Political Behavior.* II. 3 hr. Examines political behavior in terms of recent behavioral theories emanating from a variety of disciplines.

299. *Special Topics.* I, II. 1-3 hr.

300. *Introduction to Policy Research.* I. 3 hr. Introduction to the research methods and techniques used in public policy analysis. Topics include logic of inquiry, research designs, measurement, and survey and unobtrusive research. (3 hr. seminar.)

310. *Intergovernmental Relations.* II. 3 hr. Examination of the politics and policy consequences of intergovernmental relations in the United States. Topics include the development of intergovernmental relations, regulatory federalism, and integovernmental fiscal relations.

335. *Policy Analysis.* I. 3 hr. Overview of the field of public policy studies; the issues and problems involved in studying policymaking; and assessment of policy analysis as a mode of thinking and inquiry.

336. *Politics of Agenda Setting.* I, II. 3 hr. Examines the confluence of social, economic, and political influences on the development of public problems and their placement on the policy agenda.

345. *Public Administration and Policy Development.* II. 3 hr. PR: Pol. S. 140 or consent. Decision-making and policy development in the administrative process by the case method.

351. *Politics of Planned Development.* I. 3 hr. Political aspects of social, economic, and technological change, with special reference to the politics of development planning and administration.

355. *Comparative Public Policy.* I, II. 3 hr. Comparison of public policy outputs in several western European countries and Japan with emphasis on the analysis of variables that account for variations in distributive, regulative, and extractive policies.

360. *International Public Policy Analysis.* II. 3 hr. Provides a bridge between the conventional study of international relations and the analysis of externally directed public policy. Introduces the graduate student to specific policy areas such as international trade, aid, resources, and security policy.

Psychology

Degrees Conferred: B.A., M.A., Ph.D.
Contact:
William J. Fremouw, *Interim Chairperson*, 293-2004
Stanley H. Cohen, *Interim Associate Chairperson*, 293-2580
Department is in 101 Oglebay Hall.

Faculty

James F. Carruth, Ph.D. (U. Ill.)—*Director, WVU Counseling Service.* Developmental patterns of students.

Stanley H. Cohen, Ph.D. (Mich. St. U.)—*Associate Chair.* Quantitative methods, Applications of computers in behavioral sciences, Multivariate analysis.

Philip E. Comer, Ph.D. (WVU)—*Associate Director, WVU Counseling Service.* Psychotherapy diagnostics, Developmental psychology, Young adulthood.

John D. Cone, Ph.D. (U. Wash.). Behavioral assessment, Behavioral modification with children, Prevention of handicapping conditions.

Barry A. Edelstein, Ph.D. (Memphis St. U.). Social competence, Behavioral assessment, Behavior therapy.

William J. Fremouw, Ph.D. (U. Mass.)—*Chair.* Cognitive-behavioral therapy, Eating disorders.

Robert P. Hawkins, Ph.D. (U. Pitt). Behavior analysis of child behavior, Behavioral assessment, Development and evaluation of child treatment programs.

Kennon A. Lattal, Ph.D. (U. Ala.). Reinforcement theory—response-reinforcer relations, Laboratory research/animals for human behavior, Experimental analysis of behavior.

Robert W. Miller, Ph.D. (Ohio St. U.). Industrial organizational psychology/evaluation research.

Joseph Panepinto, Ph.D. (WVU)—*Adjunct.* Community psychology, Program evaluation.

Eugene A. Quarrick, Ph.D. (Syracuse U.). Psychotherapy/psychological evaluation.

Hayne W. Reese, Ph.D. (U. Iowa)—*Centennial.* Learning and retention in children as a function of cognitive processes, Life-span research methodology.

James N. Shafer, Ph.D. (Ohio St. U.). Experimental and applied behavior analysis, Educational technology, Stimulus control.

Associate Professors

Edward C. Caldwell, Ph.D. (Syracuse U.). Evaluation of educational practices, Basic research in reading.

James E. Capage, Ph.D. (Ohio U.)—*Adjunct.* Clinical assessment, Psychotherapy, Abnormal behavior.

Sharon L. Foster, Ph.D. (SUNY—Stony Brook). Social skills assessment and training (children), Family communication, Behavioral observation.

Irving J. Goodman, Ph.D. (U. Rochester). Neural mechanisms of behavior, Psychopharmacology, Behavioral neuroscience.

Lucille Nahemow, Ph.D. (Columbia U.). Life-span developmental psychology, Gerontology.

Ruth A. Panepinto, Ph.D. (WVU)—*Adjunct.* Community mental health, Alcohol/drug abuse.

B. Kent Parker, Ph.D. (U. Utah). Experimental analysis of behavior, Conditioning and learning stimulus control and memory, Research design and statistics.

Richard J. Seime, Ph.D. (U. Minn.)—*Adjunct.* Medical psychology, Psychotherapy, Psychological testing.

Trevor F. Stokes, Ph.D. (U. Kans.). Child and family behavior analysis and modification, Behavior change. (*On leave of absence.*)

Assistant Professors

Phillip N. Chase, Ph.D. (U. Mass.). Verbal behavior, Concept learning, Individualized instruction.

E. Mark Cummings, Ph.D. (UCLA). Background anger, Attachment, Day care.

Michael Franzen, Ph.D. (S. Ill. U.). Clinical neuropsychology, Behavioral medicine, Measurement methodology.
Gary G. Ganahl, Ph.D. (Ga. St. U.)—*Adjunct.* Family and marital assessment techniques, Outcome evaluation of therapy.
Virginia Goetsch, Ph.D. (U. Ga.). Behavioral medicine, Psychophysiology, Neuropsychology.
Samuel W. Goots, Ph.D. (WVU)—*Adjunct.* Psychodiagnostic evaluation, Individual and group therapy, Crisis intervention.
Anita L. Greene, Ph.D. (Boston U.). Cognitive development in adolescence, Stress (childhood and adolescence).
David Hansen, Ph.D. (U. Miss.). Social skills assessment and training (children).
Debra G. Hull, Ph.D. (Kent St. U.)—*Adjunct.* Human sexuality, Assertiveness training, Clinical and consulting.
Katherine Karracker, Ph.D. (Mich. St. U.). Infant social development, Physical appearance effects on development, Parent-infant relations.
Stephen C. Luce, Ph.D. (U. Kans.)—*Adjunct.* Behavior therapy (children), Autism.
Pamela Meadowcroft, Ph.D. (U. Pitt)—*Adjunct.* Applied behavior analysis in educational settings.
J. Vernon Odom, Ph.D. (U. N.C.)—*Adjunct.* Abnormal/normal visual development.
Michael Perone, Ph.D. (U. Wisc.). Experimental analysis of human/non-human behavior, Research methodology, Laboratory use of microcomputers.
James M. Puckett, Ph.D. (U. Mo.). Age differences in memory and cognition, Social/motivational processes in the elderly.
William K. Redmon, Ph.D. (W. Mich. U.). Applied behavior analysis, Behavioral contracting, System intervention/analysis.
Cecil J. Simons, Ph.D. (WVU)—*Adjunct.* Infant social development, Parent-infant interaction, High-risk infants and their development.
Michael Todt, Ph.D. (U. Chicago)—*Adjunct.* Organizational behavior.

Nature of Program

Courses in psychology are designed for one or more of the following ends: (1) as part of a liberal arts education, principles, methods and theories are conveyed which are necessary for a better understanding of human and animal behaviors; (2) basic preparation for students interested in graduate work leading to a career in basic or applied psychology; (3) preparation for a career as a bachelor's-level psychological assistant or technician, or as background for work in related social science fields.

The emphasis of preprofessional undergraduate training in psychology is placed on a broad liberal-arts education. Excessive specialization in psychology is discouraged for students who intend to pursue graduate training in psychology. Such students should seek a strong supporting background in mathematics and the natural and social sciences.

Degree Requirements

Required Courses

Psych. 1, 2, 19, 131, 141, 151, 171, 218; one course from the following group: Psych. 223, 224, 225, 232; 6 credit hours of 200-level psychology courses excluding Psych. 213; and Stat. 101. Thirty-two credit hours are required for a major in psychology; the remaining hours (i.e., not specified above) may be selected from among the upper-division courses.

Options

Students who major in psychology should consider three options: (1) Those primarily interested in the professional application of psychological principles to human problems should select courses from the following group:

Psych. 251, 262, 263, 264, 274, 279, 281, 282; (2) Students primarily interested in graduate training in psychology should consider taking additional courses in the Psych. 223, 224, 225, and 232 series; and (3) Students interested in psychology as it applies to their personal and social development are encouraged to take Psych. 164 and 170.

All psychology majors are encouraged to consider upper-division courses which provide an opportunity for them to apply basic principles of psychology. Particularly recommended for this purpose are Psych. 190, 195, and 213. Students must obtain instructors' consent before enrolling in these courses.

Electives in the following areas are taken frequently by psychology majors: biology, child development and family relations, computer science, mathematics, philosophy, political science, social work, sociology and anthropology, and statistics.

Courses of Instruction in Psychology (Psych.)

Lower Division

1. *Introduction to Psychology.* I, II, S. 3 hr. Survey of general psychology.

2. *Research Methods in Psychology.* I, II, S. 3 hr. PR: Psych. 1. Research methods used in experimental, developmental, clinical, and community-social psychology are studied in both the laboratory and the natural environment.

19. *Psychology As a Profession.* II. 1 hr. PR: Psych. 1. Orientation to opportunities for experience, employment, and graduate and professional training in psychology. *(For psychology majors only.)*

25. *Psychology of Academic Self Management.* I, II. 3 hr. PR: Consent. Designed to teach students: (1) the important elements of study behavior and, (2) to develop and apply a self-management program to their academic work. Classroom instruction and practical exercises. *(Does not count toward Core B requirements.)*

Upper Division

101. *Leadership and Human Relations.* I or II. 3 hr. PR: Psych. 1. Concentrates on principles of psychology that can be applied to improving relations with others as well as being a more effective leader. Pragmatic orientation includes using the principles to solve problems in relationships, in small organizations, and in large systems.

131. *Organismic Factors in Psychology.* I, II. 3 hr. PR: Psych. 1, 2. An introduction to the biological factors participating in psychological events including consideration of morphology, physiology, maturation, and evolution. Interdisciplinary studies such as behavioral genetics and ethology will also be covered.

141. *Introduction to Human Development.* I, II, S. 3 hr. PR: Psych. 1. Survey of human development across the life span with an emphasis on change in physical, cognitive, and social-emotional processes. Applied problem solving by use of developmental information provides experience for service related professions such as social work, nursing, guidance, and counseling.

151. *Introduction to Social Psychology.* I, II, S. 3 hr. PR: Psych. 1. Social factors which determine human behavior. Relationships of class, race, culture, social structure, and other group phenomena to individual behavior.

164. *Personal and Social Adjustment.* I, II, S. 3 hr. PR: Psych. 1. Applications of material from personality, abnormal, clinical, and social psychology to the problems of achieving positive personality change.

170. *Sex Roles and Behavior.* I, II, S. 3 hr. PR: Psych. 1. Relates sex-typed behavior to physiological, social, and cultural processes. Current social concerns such as rape

and abortion legislation, child care, and expanded career options for both sexes are examined from a psychological perspective.

171. *Behavior Principles.* I, II. 4 hr. PR: Psych. 1 and 2. Introductory survey of principles of behavior and learning and the significance of these principles for psychological theory and applications. Includes laboratory exercises and demonstrations.

190. *Teaching Practicum.* I, II, S. 1-3 hr. PR: Consent. *(No more than 3 hours of Psych. 190 may be counted toward the 42 hours of psychology to which majors are limited.)* Individually supervised experience in teaching, tutoring, and/or classroom management projects.

191. *Special Topics in Psychology.* I or II. 1-3 hr. PR: Consent. Contemporary topics in psychology considered at an intermediate level for both psychology majors and majors in other areas.

194. *Field Experience in Psychology.* I, II, S. 1-15 hr. PR: Psych. 191, consent. *(No more than 15 hours of Psych. 195 may be counted toward the 128 hours required for the B.A. degree.)* Individually supervised experience in the applications of psychological principles and techniques. Psychology majors have the option of including or excluding hours earned in Psych. 195 in the 42 hours of psychology to which majors are limited. The off-campus semester is offered for 15 hours of credit in this course during the first and second semesters and for 12 hours of credit during the summer. Off-campus semester placements generally require completion of Psych. 274 before enrollment in this course.

195. *Seminar in Psychology.* I or II. 3 hr. (May be repeated for credit.) PR: Junior or senior standing and consent.

196. *Senior Thesis.* I, II. 1-3 hr. PR: Consent. For students in the Psychology Honors Program.

213. *Directed Studies.* I, II, S. 1-3 hr. PR: Consent. *(No more than 10 hours may be applied to the 42 hours of psychology to which majors are limited.)* Individually supervised reading, research and/or classroom management projects.

218. *History and Systems of Psychology.* II. 3 hr. PR: 15 hr. of psychology or consent. A survey of psychology from its origins in philosophy, biology, and physics through the several major schools of psychological thought to modern perspectives of behaviors.

223. *Cognition and Memory.* I. 3 hr. PR: 9 hr. of psychology. Theoretical and empirical issues in human learning and memory with emphasis on mechanisms of memory, language, verbal behavior, and conceptual processes.

224. *Conditioning and Learning.* I, II. 3 hr. PR: Psych. 171. Survey of research in operant conditioning and its implications for behavior theory and applications.

225. *Perception.* I, II. 3 hr. PR: Psych. 131, 141. A survey of the structure and function of human sensory systems (primarily visual and auditory) and perceptual issues and theories.

232. *Physiological Psychology.* I. 3 hr. PR: Psych. 131, 141. Introduction to the physiological mechanisms of behavior.

242. *Prenatal and Infant Behavior.* I. 3 hr. PR: Psych. 131, 141. Early influences upon behavior and development are investigated; topics include behavioral genetics, hazards of prenatal development, sensory-motor development, language development, and socioemotional development.

243. *Child and Adolescent Behavior.* II. 3 hr. PR: Psych. 141. Theory and research on major psychological processes in childhood and adolescence are explored including maturation, personality, socialization, sensory, and cognitive development.

245. *Adulthood and Aging.* I. 3 hr. PR: Psych. 141. Cognitive and personality changes from maturity to old age. Psychological reactions to physiological change and to the establishment and dissolution of family units. Problems of intergenerational differences in adult behavior.

251. *Social Psychology.* II. 3 hr. PR: Psych. 151. Social factors which determine human behavior. Survey of the results of laboratory research in social psychology and its implications for social phenomena.

262. *Psychological Assessment.* II. 3 hr. PR: 9 hr. of psychology. Theory and practice in development and use of psychological assessment procedures. Includes intelligence testing, behavioral assessment, and interviewing.

263. *Comparative Personality Theory.* I, II. 3 hr. PR: 9 hr. of psychology or graduate standing. Theoretical and empirical readings in a survey of major perspectives in personality theory, including dynamic, cognitive, humanistic, and behavioral theories of personality.

264. *Psychology of Adjustment.* II. 3 hr. PR: 9 hr. of psychology or graduate standing. Dynamic principles of human personality adjustment.

274. *Survey of Behavior Modification.* I, II. 3 hr. PR: Psych. 171. Behavior therapy and modification including desensitization, covert sensitization, interpersonal skill training, aversion techniques, and applied behavior analysis employing operant principles.

279. *Community Psychology.* I. 3 hr. PR: Psych. 151. Psychological principles applied to treatment and intervention strategies at the community level. Manpower development, organizational change, and systems analysis.

281. *Abnormal Psychology.* I, II. 3 hr. PR: 9 hr. of psychology or graduate standing. Major categories of behavior disorders, e.g., neuroses, psychoses, and character disorders are considered in terms of etiology, treatment, outcome, and prevention.

282. *Exceptional Children.* I, II. 3 hr. PR: Psych. 141. Study of children who present psychological problems: (1) exceptional mental retardation or advancement; (2) organic disabilities having behavioral consequences, such as cerebal palsy or deafness; and (3) behavior disorders.

297. *Honors Investigation and Thesis.* I, II. 3 hr. *(May be repeated for credit; max. credit 6 hr.).* PR: Admission to Honors Program in Psychology. Supervised readings and investigation culminating in the honors thesis.

Public Administration (Pub. A.)

Degree Conferred: M.P.A.
Contact: David G. Williams, *Chairperson*, 293-2614
Department is in 302 Woodburn Hall

Courses of Instruction in Public Administration (Pub. A.)

Upper Division

242. *American Administrative Systems.* I. 3 hr. Analysis of the nature and processes of American public administration (political, legal, economic, and social conditions), including the role of the bureaucracy in a democracy. *(Equiv. to Pol. S. 242.)*

Religious Studies

Degree Conferred: (None. See B.A. Interdepartmental Studies Option).
Contact: Manfred O. Meitzen, *Chairperson*, 293-4995
324 Stansbury Hall

Faculty

Professor

Manfred O. Meitzen, Ph.D. (Harvard U.)—*Chair.* Contemporary theology, New Testament studies, Ethics.

Associate Professors

Ottomar F. Cypris, Th.D. (Union Theol. Sem.)—*Emeritus.*

Alan W. Jenks, Th.D. (Harvard U.). Old Testament language and literature, Middle Eastern studies.

Nature of Program

The Department of Religious Studies in its courses offers instruction in the field of our experience concerning God, the transcendent, and ultimate concern. Such studies include both our intellectual activity about this experience (theology) as well as our resultant deeds in worship and ritual, ethics, and history. The curriculum is devoted to the study of the world's great scriptures, history of religions, contemporary religious thought, and the interrelation of theology and culture. Attention is given to the relevance of the subject matter to the lives of the students. Religious studies courses may be taken for University Core Curriculum credit (except Relig. 290 and 491), as well as elective credit, and are meant for the enrichment of the global, liberal arts education of the student. Also, an interdepartmental major in religious studies may be undertaken. (See page 100).

Admission Requirements

Admission to the Interdepartmental degree program in Religious Studies requires at least a cumulative average of 2.0.

Degree Requirements

A total of 42 hours is required in Religious Studies and related fields in order to obtain an interdepartmental degree in Religious Studies. Of these hours, 21 hours of Religious Studies courses must be taken. Of these 21 hours, 6 hours must be taken in biblical studies, 6 hours in the history of religions, 6 hours in contemporary religious thought, and one 3-hour seminar on a selected topic. The other 21 hours fulfill requirements outside the Department of Religious Studies. The following 3-hour courses are specifically required: Soc. & A. 5, 136, Hist. 101, 103, and Phil. 123. Also 6 hours of American and/or English literature is required. Students must maintain at least a 2.0 cumulative average in the required course work in order to retain status as an interdepartmental major in Religious Studies.

Options

The Interdepartmental Degree Program in Religious Studies affords students a large amount of discretion in the area of elective work. It would even be possible for a student, by planning carefully, to arrange a double major in another subject while undertaking the interdepartmental major in Religious Studies.

Courses of Instruction in Religious Studies (Relig.)

Lower Division

5. *An Introduction to Issues in Religious Studies.* I. 3 hr. *(For freshman students only.)* Leading issues involved in religious studies: transcendence, the God question, evil, redemption, community, eschatology, symbolism, ethics, examples of the relationship between religion and culture.

Upper Division

100. *Introduction to the Synoptic Gospels.* I, II. 3 hr. Introduction to the origin and content of the Synoptic Gospels of the New Testament (Matthew, Mark, Luke). Discusses a number of basic theological issues and relates to the contemporary situation.

101. *A Study of Paul.* II. 3 hr. Introduction to the life and theology of Paul, involving a study of the letters of Paul and other pertinent early Christian literature. Discusses a number of basic theological issues and constantly relates Scripture teachings to the contemporary situation.

102. *Introduction to the Old Testament.* I. 3 hr. The story of Israel, her religious life, and great personalities up to about 800 B.C., based on a study of Genesis through II Kings. Basic theological and ethical issues are discussed in relation to the contemporary situation.

103. *Introduction to the Old Testament.* II. 3 hr. The story of Israel, her religious life, and great personalities from 800 B.C. to about 100 B.C., based on a study of the prophetic and wisdom literature of the Bible. Basic theological and ethical issues are discussed in relation to the contemporary situation.

104. *Origins of Judaism.* I or II. 3 hr. PR: Sophomore standing or above, or a previous religious studies course. Main beliefs and practices of the Jewish religion in its formative period, 500 B.C. to 500 A.D. Selections from late Old Testament writings, the Apocrypha and Pseudepigrapha, the Dead Sea Scrolls, and rabbinical literature.

105. *Introduction to the Johannine Literature.* I or II. 3 hr. Introduction to the origin and content of the Johannine Literature of the New Testament (Gospel, Epistles, and Revelation to John). Discusses a number of basic theological issues and relates them to the contemporary situation. *(Course will not be offered in 1986-87.)*

110. *Contemporary Theology 1.* I. 3 hr. Issues include: function of reason in Judaeo-Christian faith and relationship of reason and revelation to each other; Judaeo-Christian understanding of history; the question of Biblical literalism. *(Course will not be offered in 1986-87.)*

111. *Contemporary Theology 2.* II. 3 hr. Issues include: ecumenical movement within the church; the Spirit; recent transformations in ethical and social thinking (new morality); secular theology (new theology), theology of hope.

112. *Existential Theology.* I or II. 3 hr. An introduction into existentialism and its impact on theology. A dialog between existential problems (anxiety, loneliness, meaninglessness, guilt, death, lust, wrath, etc.) and the response of Judaeo-Christian faith. *(Course will not be offered in 1986-87.)*

120, 121. *History of Christian Thought.* I, II. 3 hr. per sem. A study of significant men and movements of thought among the Christians and the way in which these contributed to answering the perennial questions of religion from a Christian perspective. Relig. 120 covers the history of Christian thought to 1500; Relig. 121 from 1500 to the present. *(Courses will not be offered in 1985-86.)*

128. *History of American Religions.* I or II. 3 hr. The origins, growth, and influence of major religious ideas and movements which were significant in shaping the religious life of the American people from colonial times to the present.

130. *World Religions: Religions of India.* I. 3 hr. PR: Sophomore standing or above, or a previous religious studies course. Proto-Indian religion, Hinduism, beginnings of Buddhism, Jainism, Sikhism; historical and theological foundations; developments of thought; and contemporary expressions and encounters with the modern world.

131. *World Religions: China and Japan.* II. 3 hr. PR: Sophomore standing or above. Buddhism, Confucianism, Taoism, Shinto; historical and theological foundations, developments of thought; and contemporary expressions and encounters with the modern world.

132. *World Religions: Near Eastern.* I or II. 3 hr. PR: Sophomore standing or above, or a previous religious studies course. The ancient religions of Mesopotamia, Egypt, and Iran, and the origin and growth of Islam; historical and theological foundations; developments of thought; scriptures; and contemporary expressions and encounters with the modern world.

142. *Theological Perspectives in Modern Literature.* I or II. 3 hr. PR: Sophomore standing or above, or a previous religious studies course. Theological perspectives in selected modern writers including Beckett, Camus, Faulkner, Hesse, Hopkins, Wiesel, Eliot, and Auden. Theological insights into nihilism, evil, redemption, and meaning, as well as psychological analyses of religion, will be examined in these authors. Team-taught.

150. *Biblical Ethics and Contemporary Issues.* I or II. 3 hr. Basic topics treated: principal types of ethics, sin, guilt, law, grace, the state, non-biblical ethics, etc. Ethical issues of the contemporary world: bioethics, euthanasia, environmental ethics, sex, etc. *(Course will not be offered in 1986-87.)*

197. *Honors Course in Religious Studies.* I or II. 3 hr. *(Open to Honors students and Interdepartmental Religious Studies majors only.)* A basic, theological topic, which is suitable for study by an undergraduate Honors student or by an Interdepartmental Religious Studies major, will be selected for each semester.

290. *Seminar: Selected Topic.* I or II. 3 hr. PR: A previous religious studies course or consent.

Slavic Studies

See Interdepartmental Majors, pages 100-101.

Social Science (S. Sci.)

Lower Division

1. *Introductory General Course.* I. 3 hr. An introduction to the technological, economic, social, and political dimensions of society using a cross-cultural approach.

Sociology and Anthropology

Degrees Conferred: B.A., M.A.
Contact:
Ann L. Paterson, *Chairperson*, 293-5801
Aaron M. Podolefsky, *Associate Chairperson*, 293-5801
Patricia Rice, *Undergraduate Adviser*, 293-5801
423 Hodges Hall

Faculty

Professors

Richard A. Ball, Ph.D. (Ohio St. U.)—Sociology. Deviant behavior, Criminology, Social psychology.
Harold H. Gibbard, Ph.D. (U. Mich.)—Sociology. *Emeritus.*
Harold N. Kerr, Ph.D. (Ohio St. U.)—Sociology. *Emeritus.*
Jiri T. Kolaja, Ph.D. (Cornell U.)—Sociology. Complex organization, Social planning, Russia.

Arnold J. Levine, Ph.D. (Columbia U.)—Sociology. Health and illness, Urban, ESOP.
John D. Photiadis, Ph.D. (Cornell U.)—Sociology. Social change, Research methods, Appalachia.
Leonard M. Sizer, Ph.D. (U. Iowa)—Sociology. *Emeritus.*
Jerold M. Starr, Ph.D. (Brandeis U.)—Sociology. Life course, Social movements, Sociology of knowledge.

Associate Professors

Ronald C. Althouse, Ph.D. (U. Minn.)—Sociology. Theory, Work, occupational safety and health.
Robert D. Foss, Ph.D. (U. Nev.)—Sociology. Social psychology, Data analysis, American family.
David S. Hall, Ph.D. (U. Ky.)—Sociology. Medical, health care delivery.
Rusi Hilloowala, Ph.D. (U. Ala.)—Anthropology. *Adjunct.* Physical.
Ann L. Paterson, Ph.D. (Mich. St. U.)—Sociology. *Chair.* Education, Sex roles, Socialization.
Aaron Podolefsky, Ph.D. (SUNY—Stony Brook)—Anthropology. Law, Community crime prevention, Oceania.
John F. Schnabel, Ph.D. (U. Notre Dame)—Sociology. Race relations, Religion, Teaching sociology.
Joseph J. Simoni, Ph.D. (U. Notre Dame)—Sociology. Community, Ethnic relations, Health communication.
William I. Torry, Ph.D. (Columbia U.)—Anthropology. Economic development, Ecology, Africa.
Roger B. Trent, Ph.D. (U. Wash.)—Sociology. Social demography, Research methods, Applied.

Assistant Professors

Janet G. Brashler, Ph.D. (Mich. St. U.)—Anthropology. *Adjunct.* Archeology.
Lawrence T. Nichols, Ph.D. (Boston C.)—Sociology. Criminology, Social change, Theory.
Patricia C. Rice, M.A. (Ohio St. U.)—Anthropology. Prehistoric art, Physical, Archeology.
Dorothy B. Rosenberg, Ph.D. (U. Pitt)—Sociology. *Part-time.* Death and dying, Gerontology.

Nature of Program

Sociology and anthropology courses constitute an important part of a general liberal education. They foster an awareness of the structure of human societies and of the social processes which operate in all groups, organizations, and institutions. The student is exposed to the methods of inquiry that sociology and anthropology have in common as well as to special knowledge and insights of the two disciplines. Courses in the department also are intended to facilitate the application of sociological and anthropological principles to the wide range of contemporary social problems. Undergraduate training in the department is particularly relevant for students in psychology, political science, economics, social work, education, communication, and the humanities. Sociology and anthropology also constitute an important part of the undergraduate education for those pursuing careers in law, the health professions, or business, and for engineers and scientists concerned with environmental and ecological problems. Majors in sociology and anthropology often find employment doing applied research with government agencies, assisting in community development and planning, or using knowledge of social organization and social process in a variety of settings within the United States or abroad. Majors are well equipped for graduate training in the social sciences in pursuit of academic or applied research careers.

Degree Requirements: B.A. and 5-Year B.A./M.A. in Applied Research

B.A. in Sociology and Anthropology

While all students are required to take both sociology and anthropology basic courses, students have the option of concentrating in sociology or in anthropology, or in a combination of these two fields.

Students in all concentrations are required to take the following courses:

1. Stat. 101 or equivalent, preferably taken in the sophomore year. (PR: Math. 3 or equiv.)
2. Soc. & A. 1, preferably taken in freshman or sophomore years.
3. Soc. & A. 5, preferably taken in freshman or sophomore years.
4. Soc. & A. 201, for the sociology concentration (taken in senior year); *or* Soc. & A. 255, for the anthropology concentration (taken in senior year); *or* Soc. & A. 201 and 255, for the combined sociology and anthropology concentration.
5. Soc. & A. 211.
6. Soc. & A. 256. (Stat. 101 and Soc. & A. 211 are prerequisites.)

In addition to the above required courses, majors concentrating in sociology are required to take an additional 15 hours in upper-division sociology courses (one of these courses should be at the 200 level) and a 3-hour course in cultural anthropology or archaeology.

Majors concentrating in *anthropology* are required to take Soc. & A. 152, 12 additional hours in upper-division anthropology (3 hours of which must be in an approved 200-level course), and an additional 3-hour course in upper-division sociology.

Majors choosing the combined *sociology and anthropology* concentration are required to take Soc. & A. 152, 9 additional hours in upper-division sociology courses, and 6 additional hours in upper-division anthropology courses.

All students are required to have a 2.0 grade-point average in department courses for graduation.

5-Year B.A./M.A. Program in Applied Research

Undergraduate students majoring in Sociology and Anthropology *at WVU* who have a grade-point average of 3.0 or better may apply in their junior year to enter the 5-year B.A./M.A. program which allows students to complete the M.A. degree in one year after the B.A. instead of the normal two years. This is accomplished by having senior majors use some of their free hours to take specific courses required in the graduate program. Students must complete the methods sequence (Stat. 101, Soc. & A. 211 and 256) no later than the junior year to allow proper sequencing of graduate-level courses. Students who elect this option complete all the regular requirements for the degree of B.A. in Sociology and Anthropology and apply for admission to the Sociology and Anthropology graduate program upon completion of the B.A. degree. Interested students should consult with the Department Chairperson prior to registering for their junior-year courses.

Courses of Instruction in Sociology and Anthropology (Soc. & A.)

Lower Division

1. *Introduction to Sociology.* I, II, S. 3 hr. Basic course intended to develop a perspective about the nature of social processes and the structure of society.

5. *Introduction to Anthropology.* I, II, S. 3 hr. Essentials of human evolution and culture history with a consideration of varieties of languages and cultures found among peoples of the world.

7. *Social Problems.* I, II. 3 hr. Causes of social disorganization in modern society and social life. Emphasis on research findings derived from studies of contemporary American society.

51. *World Cultures.* II. 3 hr. A case study approach to the comparative examination of peoples and cultures around the world. Cases chosen range from small-scale, face-to-face tribal communities to folk and modern societies.

Upper Division

121. *The Family.* I, II. 3 hr. Comparative approach to changing structure and functions of the family institution. The effect of economic, demographic, and cultural changes on male-female relationships, sex roles, marriage, and child care.

122. *The Community.* I. 3 hr. Social structure of small towns and rural communities. The community power structure and political participation as they relate to community planning.

123. *Death and Dying.* I. 3 hr. Sociological and anthropological perspectives on death and dying. Examines sociopsychological and structural factors supporting the beliefs and practices associated with the institution of death, both historically and in contemporary society.

125. *Illness and Health Care.* I. 3 hr. An overview of behavioral factors relating to occurrence of and responses to illness, with particular emphasis upon American medicine. Designed especially for students interested in health-related careers.

131. *Urban Society.* II. 3 hr. Ecological, demographic, and sociocultural patterns of cities and their hinterlands, including a study of racial and ethnic neighborhoods of the inner city and the process of suburbanization.

132. *Criminology.* I, II. 3 hr. Exploration of various theories of criminal behavior; emphasis on a critical study of the criminal justice system and efforts to reform the penal system.

133. *Juvenile Delinquency.* I, II. 3 hr. Nature, extent, and causal explanation of forms of juvenile deliquency. The nature of juvenile courts, the correctional system, and prevention programs. Emphasizes current issues.

135. *Race Relations.* I or II. 3 hr. Causes and consequences of prejudice and discriminatory practices involving minority group members. Emphasis is on blacks, but social and economic conditions of Indians and other racial and religious minorities are also discussed.

136. *Sociology of Religion.* I or II. 3 hr. Relationship of religion and society. Origin of religious institutions, structure, function, and role in change or stability of the social system.

138. *Ethnic Groups.* I or II. 3 hr. Study of the major ethnic groups in the U.S., their social histories and present importance to the nation. Family histories are explored. Includes study of Irish, Polish, Italian, Greek, Mexican, Oriental and Native Americans.

140. *Social Change in Appalachia.* I or II. 3 hr. Description of early Appalachian society as a prelude to the understanding of the economic, social, and cultural changes taking place today. The family, church, education, social class, and community structure. Programs of directed intervention, change, and development discussed.

145. *Soviet Society.* I or II. 3 hr. Social and cultural trends in contemporary Soviet Union. Population characteristics, ethnic and nationality diversity; the family, education, political institutions and social classes; agricultural, industrial, and scientific organization. Comparisons with United States society.

151. *Ethnology.* I or II. 3 hr. Descriptive study of peoples and cultures of the world, especially pre-industrial societies. *(Course will not be offered in 1985-86.)*

152. *Physical Anthropology.* I. 3 hr. Fossil evidence for human evolution, racial variation, and relationship between biology and behavior.

153. *Cultures of the South Pacific.* I or II. 3 hr. Peoples and cultures of the South Pacific (Polynesia, Melanesia, and Micronesia) are examined. Topics include environment, prehistory, colonization, as well as traditional social organization, food production, child rearing, politics, law, warfare, religion, and cargo cults. *(Course will not be offered in 1986-87.)*

156. *Traditional and Changing Africa.* I or II. 3 hr. A survey of traditional social institutions found in hunting/collecting, agricultural, and pastoral societies of sub-Saharan Africa. Labor migration, urbanization, agricultural cooperatives, and other consequences of colonial rule will be considered.

157. *The Art of Primitive Peoples.* I or II. 3 hr. The art of prehistoric peoples from the Upper Paleolithic to the Urban Phase and the art of contemporary technologically primitive peoples will be described and functionally analyzed within their individual cultural contexts.

158. *Introduction to Archaeology.* II. 3 hr. Prehistoric cultures of the world and methods used in reconstructing them.

159. *World Prehistory.* I or II. 3 hr. A survey of prehistoric cultures from the lower paleolithic to the rise of cities in both the old and new worlds. 3 hr. lec. *(Course will not be offered in 1986-87.)*

160. *Sociology of Sex Roles.* II. 3 hr. Overview of social and cultural influences on sex (gender) roles. Focuses on contemporary social arrangements and ideologies which support expected sex role behavior. Includes historical and cross-cultural comparisons.

190. *Teaching Practicum.* I, II, S. 1-3 hr.

191. *Special Topics.* I, II, S. 1-3 hr. Course topics change. Students may enroll more than once.

194. *Professional Field Experience.* I, II, S. 1-18 hr. variable. (May be repeated to a maximum of 18 hr.) PR: Consent. Prearranged experimental learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

195. *Seminar.* I or II. 1-3 hr.

201. *Sociological Theory.* II. 3 hr. PR: 6 hr. Soc. & A. and senior standing or consent. Systematic analysis of major sociological theories viewed from the historical perspective and in terms of current research.

202. *Deviant Behavior.* II. 3 hr. PR: 6 hr. Soc. & A. or consent. Examination of the processes by which "deviance" is defined in society, and the methods of social control attempted. Provides a critical understanding of society from the perspective of those defined as "outsiders"—criminals, addicts, etc.

204. *Complex Organizations.* II. 3 hr. PR: 6 hr. Soc. & A. or consent. The structure and functioning of large-scale, bureaucratic organizations, including studies of industrial organizations, prisons, hospitals, government bureaus, and the military in contemporary society.

205. *Class, Status, and Power.* I or II. 3 hr. PR: 6 hr. Soc. & A. or consent. Analysis of various systems of social inequality. Emphasis on empirical studies describing social class system, distribution of status and power, and patterns of social mobility in America.

211. *Social Research Methods.* I, II, S. 3 hr. PR: Soc. & A. 1 or 5 or consent. Logic of social research, elements of research design, and problems of measurement, with emphasis on survey research methodology and data analysis.

222. *Community Development.* II. 3 hr. PR: Soc. & A. 122, 133, 140, or consent. Application of sociological knowledge of structure of communities for planning programs and services. Emphasis on techniques of organizing efforts for community change.

223. *Sociology of Rural Life.* I or II. 3 hr. PR: Soc. & A. 1 or consent. Social aspects of rural living. Characteristics of rural population, social structure, and institutional arrangements: family, community, education, religion, recreation, health, welfare, and local government.

232. *Sociology of Education.* I. 3 hr. PR: Soc. & A. 1, or consent. Education as a social institution, cultural and class influences on education, social roles and career patterns in the school system, the school and problems of the community. *(Also listed as Ed. F. 300.)*

233. *Sociology of Work and Work Places.* I. 3 hr. PR: Soc. & A. 1 or consent. Explores the significance of work and work relations in contemporary society. Emphasis is given to the analysis of employment settings including industrial organizations.

240. *Social Change.* I or II. 3 hr. PR: 6 hr. Soc. & A. or consent. Sociological analysis of current major changes in our society, of the forces underlying them, and of tensions to which they give rise. Alternative future directions and rational manipulation and planning for social change. *(Course will not be offered in 1986-87.)*

253. *Religion, Magic, and Healing.* I. 3 hr. PR: 6 hr. Soc. & A. or consent. Symbolism, magic, ritual, shamanism, sorcery, and concepts of sin and salvation related to peasant and tribal cosmologies will be examined as causes of and remedies for suffering in traditional and modern contexts. *(Course will not be offered in 1986-87.)*

255. *Anthropological Theory.* II. 3 hr. PR: 6 hr. Soc. & A. or consent. Theoretical landmarks in early and modern anthropology. Includes British functionalism, psychological anthropology, French structuralism, and twentieth-century evolutionism in the United States.

256. *Field Methods.* II. 3 hr. PR: Soc. & A. 211 and Stat. 101 or consent. The distinctive craft of data gathering in cultural anthropology. Development of skills in field methods and participant observation.

257. *Primate Behavior.* I or II. 3 hr. PR: 3 hr. of any behavioral science or consent. Primates as they exist in their natural habitats suggest clues to early human behavior and evolution of behavior. Case studies and comparative behavior from prosimians, monkeys, and apes to human hunters and gatherers. *(Also listed as Biol. 235.)*

260. *Society and Personality.* I or II. 3 hr. PR: 6 hr. Soc. & A. or consent. Interaction between society and the individual's behavior. Key concepts are social role and the social self. Focus on adult experiences and adult socialization.

261. *Criminal Justice in America.* I or II. 3 hr. PR: 6 hr. Soc. & A. or consent. Critical examination of law, police, courts, and corrections (adult and juvenile); conservative, reform, and radical evaluations. Emphasizes such current issues and innovations as civil liberties, victimless crimes, prison reform, professionalization, community-based corrections, and behavior modification.

262. *Youth and Social Change.* I or II. 3 hr. PR: 6 hr. Soc. & A. or consent. A structural-historical approach to the study of youth as both product and agent of social change. Emphasizes concepts of human development, life course transition, age stratification, birth cohort, lineage, historical period, and sociocultural generation.

290. *Special Topics.* I, II, S. 1-3 hr. PR: 6 hr. Soc. & A. or consent. Topics change so students may enroll more than once.

291. *Honors Seminar.* I or II. 1-3 hr.

293. *Independent Study.* I, II, S. 1-6 hr. per sem. PR: 3.0 grade-point average and written departmental permission. Directed reading or research for students desiring work not available in regular course offerings.

311. *Survey Research Methods.* I. 3 hr. PR: Soc. & A. 211 and Stat. 101 or consent. Provides students with an overview of survey research including problem definition, research design, sampling, measurement, instrument construction, project management, ethical considerations, and report writing.

313. *Qualitative Methods.* I. 3 hr. Provides students with supervised field experiences in interviewing, participant observation, and other methods of qualitative data gathering, analysis, and presentation.

315. *Comparative Research Methods.* II. 3 hr. Examines the relationship between theory and research through critical comparison of the principal designs and methods used in the social sciences. Special attention to alternative strategies for studying social service institutions.

317. *Data Analysis.* II. 3 hr. PR: Stat. 101 or equiv. Using social science survey data, this course integrates statistics, computer usage, and social science theory to examine alternative methods of analyzing social science data. Makes extensive use of SPSS software package.

318. *Data Analysis.* I. 3 hr. PR: Soc. & A. 317. Continuation of Soc. & A. 317.

319. *Microcomputer Applications.* I. 1 hr. PR: Soc. & A. 311 or consent. A directed tutorial in selected social science applications of microcomputer use with emphasis on production of research reports *(S/U grading only.) (Soc. & A. majors only.)*

322. *Contemporary Sociological Theory.* I or II. 3 hr. PR: Soc. & A. 201 or consent. Review of recent trends and orientations in sociology. Theory construction, typologies, mathematical models, and the relationship between theory and research. Review of current literature.

372. *Sociology of Health.* II. 3 hr. PR: Soc. & A. 125 or consent. A seminar focusing upon current issues in medical sociology.

Speech Communication

Degrees Conferred: B.A., M.A.
Contact:
James C. McCroskey, *Chairperson*, 293-3905
Lawrence R. Wheeless, *Associate Chairperson*, 293-3905
John D. Shibley, *Undergraduate Adviser*, 293-3905
Department is in 130 Armstrong Hall

Faculty

Professors

Leonard M. Davis, Ph.D. (Northwestern U.). Communication: Organizational, Problems of children, Rhetoric and theory.

Donald W. Klopf, Ph.D. (U. Wash.). Intercultural and small-group communication, Persuasion.

James C. McCroskey, Ed.D. (Penn St. U.)—*Chair.* Communication: Avoidance, Instruction, Interpersonal and organizational.

Virginia P. Richmond, Ph.D. (U. Nebr.). Communication: Interpersonal and organizational, Nonverbal, Instruction.

Lawrence R. Wheeless, Ph.D. (Wayne St. U.)—*Associate Chair.* Communication: Interpersonal and organizational, Empirical methodology, Instruction.

Associate Professors

Walter H. Rockenstein, Ph.D. (Northwestern U.)—*Emeritus.*

John D. Shibley, Ph.D. (Ohio St. U.). Film appreciation, Communication and nonviolence.

Virginia E. Wheeless, Ph.D. (U. Nebr.). Communication: Interpersonal and organizational, Female-male.

Assistant Professors

Melanie Booth-Butterfield, Ph.D. (U. Mo.). Communication: Interpersonal, Nonverbal, Instruction.

Joan S. Gorham, Ed.D. (North. Ill. U.). Communication: Instruction, Nonverbal.

Enid J. Portnoy, M.A. (Northwestern U.). Communication: Aging, Nonverbal.

Walter R. Zakahi, Ph.D. (Bowl. Grn. St. U.). Communication: Interpersonal, Nonverbal, Theory.

Instructor

Charles McAliley, M.A. (WVU). Communication: Interpersonal, Nonverbal.

Nature of Program

The B.A. program in Speech Communication offers a curriculum designed to meet the needs of liberal arts and pre-professional students, as well as students oriented toward communication-related careers. The curriculum focuses upon the application of theory and research in human communication to a variety of personal and social settings. Two program options are available to students who meet applicable admission requirements:

Communication Theory and Research Option. This option is designed for students who desire a broad, liberal arts emphasis or who plan to pursue graduate study in communication. The option focuses on course work in the areas of interpersonal, nonverbal, and organizational communication.

Applied Communication Studies Option. This option is designed for students who plan careers in business or government organizations. It combines the general degree program in speech communication with a sequence of courses outside the department which prepares students for communication-related careers.

Admission Requirements

Admission to the degree program may be requested upon the completion of 45 undergraduate hours including the following required courses in Speech Communication: Spch. 11, 12, 13, 14, 160. To be admitted to the Applied Communication Studies Option, the student must present a cumulative grade-point average of at least 2.25 and have completed the above required courses with a grade-point average of at least 2.5. To be admitted to the Communication Theory and Research Option, the student must present a cumulative grade-point average of at least 3.0 and have completed the above required courses with a grade-point average of at least 3.0. Students initially admitted to the Applied Communication Studies Option may transfer to the Communication Theory and Research Option at such time as they achieve a cumulative grade-point average of at least 3.0, have completed at least 19 hours in Speech Communication with a grade-point average of at least 3.0, and have completed all University and College of Arts and Sciences Core Curriculum requirements. If the total number of applicants for admission to the department exceed the department's capacity, students with higher grade-point averages will receive preference.

Degree Requirements

Minimum requirements for graduation with a degree in speech communication are 36 hours of course work in speech communication with a

cumulative grade-point average of at least 2.5. (*Note:* A maximum of 42 hours in Speech Communication may be counted toward meeting graduation requirements.) and a cumulative grade-point average of at least 2.0 for all courses across all departments taken toward the degree. Students must complete a minimum of 45 hours after the semester in which they are admitted to the department.

Additional requirements for students in the Applied Communication Studies Option are as follows:

Spch. 106, 109, 111, 133, and 221 and 11 hours of Speech Communication electives.

6 hours selected from English 105, 108, and 208.

Psych. 1 and 2.

Management 105.

18 hours selected from two or more categories—Journalism Skills: Journ. 1, 15, 18, 19, 50; Management: Mgt. 205, 206, 216, 217; Marketing: Mrktg. 111, 113, 114, 115, 120, 205; Organizational Behavior: Psych. 101, 151, 251; Soc. & A. 204, 233; Pol. S. 120, 140; Public Relations and Advertising: Journ. 111, 113, 114, 121, 124.

Advisement

Before or during the first semester of the sophomore year, students interested in admission to the Department of Speech Communication should consult with the Undergraduate Adviser.

Courses of Instruction in Speech Communication (Spch.)

Lower Division

11. *Principles of Human Communication.* I, II, S. 1 hr. Introduction to the human communication process with emphasis on the principles, variables, and social contexts of communication.

12. *Human Communication in the Interpersonal Context.* I, II, S. 2 hr. PR or Conc.: Spch. 11. Introduction to interpersonal communication with emphasis upon application of one-to-one communication in a variety of social contexts.

13. *Human Communication in the Small Group.* I, II, S. 2 hr. PR or Conc.: Spch. 11. Introduction to small-group communication with emphasis upon application in a variety of social contexts.

14. *Human Communication in the Public Communication Context.* I, II, S. 2 hr. PR or Conc.: Spch. 11. Introduction to principles of communication in the one-to-many context.

21. *Human Communication in a Contemporary Society.* I, II, S. 3 hr. Introduction to principles of communication and decision making in significant issues in a free society. Emphasis on topics such as freedom of speech and press.

80. *Introduction to the Mass Media.* I, II. 3 hr. Critical examination of mass media with special emphasis on ways in which social, economic, and psychological factors influence the structure, functions, and efforts of the media.

Upper Division

105. *Special Topics in Human Communication.* I, II. 3 hr. (Repeatable to 6 hr. total.) PR: Spch. 11. Topics include communication and conflict resolution, role of communication in negotiation and bargaining, contemporary communication criticism, issues in communication fields, etc.

106. *Nonverbal Communication.* I, II. 3 hr. PR: Spch. 11. An examination of the effects of human nonverbal behavior on human communication. Emphasis on specific nonverbal behaviors including touch, time, environmental contexts, physical appearance cues, and social communication cues.

107. *Human Communication and Rational Decisions.* I. 3 hr. Argumentation, small group, persuasion, and systems theories application to the process and outcome of rational decision making in communication. Some emphasis on critical-rational response to manipulative communication.

108. *Nonviolence in Communication Behavior.* I. 3 hr. Nonviolent resistance as communication behavior. Emphasis on major proponents of and upon learning ways to apply nonviolence in communication behavior.

109. *Human Communication in Organizations and Institutions.* I, II. 3 hr. PR: Spch. 11. Communication processes and problems in business and nonbusiness organizations and institutions with attention to practical application.

111. *Organizational Communication and Change.* I, II. 3 hr. Focuses on communication competencies needed for survival in organizations. Emphasis on communication of change, diffusion of innovations, communication flow, formal/informal communication roles, management communication styles, power, conflict, status, and effective supervisory/subordinate communication.

131. *Human Communication and Language Behavior.* I, II. 3 hr. Introduction to the production and use of language with emphasis on linguistic, psychological, sociological, and developmental perspectives on language in human communication.

133. *Interpersonal Communication.* I, II. 3 hr. PR: Spch. 11. Survey of theoretical and research literature in interpersonal communication. Emphasis on interaction, interpersonal understanding, personal relationships, and self understanding as outcomes in interpersonal communication.

134. *Gender and Communication.* 3 hr. PR: Spch. 12 or 133, or consent. The similarities and differences of communication variables for males and females. Theoretical implications in the study of the gender variable with practical applications in different contexts.

140. *Communication and Aging.* I, II. 3 hr. Examining the influence of aging on communication, concentrating on persons over age 55. Social, psychological, biological, and sensory communication adjustments. Multidisciplinary approach to aging theories. Direct interaction with an elderly person is required.

160. *Communication Research Methods.* I. 3 hr. PR: Pre-Speech major or consent. Research methods in human communication and related professional areas with emphasis on understanding and evaluating research procedures. Special focus on practical applications.

161. *Directed Studies in Human Communication.* I, II. 3 hr. PR: Spch. 160. (Repeatable to 6 hr. total.) Independent study and research in special areas of human communication.

180. *Effects of Mediated Communication.* I, II. 3 hr. PR: Spch. 11. Messages and characteristics of mass media with emphasis on effects of mass communication on society.

187. *Appreciation of the Motion Picture.* I, II. 3 hr. Evaluation of motion picture and television film as forms of mediated communication and as art forms involving communication and aesthetic principles. Emphasis on the feature-length theatrical fiction film.

190. *Teaching Practicum.* I, II. 1-3 hr. (Repeatable to 6 hr. total.) PR: Consent. Individually supervised experiences in assisting with teaching, tutoring, and/or classroom management projects.

191. *Special Topics in Speech Communication.* I, II, S. 1-3 hr. (Repeatable to 6 hr. total.)

195. *Field Experiences in Human Communication.* I, II, S. 1-3 hr. (Repeatable to 12 hr. total.) PR: Speech major and consent.

201. *Principles of Communication Education.* I, II. 3 hr. PR: 15 hr. speech communication. Literature, principles, and current practices of communication education in public schools with directed application. Intended for teachers in communication and language arts.

206. *Advanced Study in Nonverbal Communication.* I, II. 3 hr. PR: Spch. 106. Functions of nonverbal communication including status, power, immediacy, relationship development, regulation, turn-taking, leakage and deception, intuition, person perception, and emotional expressions.

221. *Persuasion.* I, II. 3 hr. PR: Spch. 11. Theory and research in persuasion, emphasizing a critical understanding and working knowledge of the effects of social communication on attitudes, beliefs, and behavior.

230. *Survey of Rhetorical-Communication Theory.* I, II. 3 hr. PR: Spch. 11. A survey of theory in the rhetorical communication context with emphasis upon periods preceding the twentieth century.

231. *Communication and Symbol Analysis.* I, II. 3 hr. PR: Spch. 131. Advanced study of language in communication. Specific attention to conversational analysis.

Statistics

Degrees Conferred: B.S., M.S.
Contact:
Donald F. Butcher, *Chairperson*, 293-3607
Stanley Wearden, *Pre-Statistics Adviser*, 293-3607
Department is in 308 Knapp Hall.

Faculty

Professors

Donald F. Butcher, Ph.D. (Iowa St. U.)—*Chair, Statistics and Computer Science.* Design and analysis of experiments, Monte Carlo simulation, Regression analysis.
E. James Harner, Jr., Ph.D. (Cornell U.). Robust estimation, Statistical computation, Modeling observational studies.
William V. Thayne, Ph.D. (U. Ill.). Statistical genetics, Regression analysis.
Stanley Wearden, Ph.D. (Cornell U.). Biometrics, Statistical genetics, Population biology.

Associate Professors

Daniel M. Chilko, M.S. (Rutgers U.). Statistical computing, Computer graphics.
Shirley M. Dowdy, Ph.D. (U. N. Dame). Sampling, Statistical methods, Software for statistical education.
Erdogan Gunel, Ph.D. (SUNY—Buffalo). Bayesian inference, Categorical data analysis, Biometry.
Gerald R. Hobbs, Jr., Ph.D. (Kans. St. U.). Nonparametric statistics, Regression analysis.
Edwin C. Townsend, Ph.D. (Cornell U.). Design and analysis of experiments, Linear models.

Nature of Program

The Department of Statistics and Computer Science offers a degree program leading to a Bachelor of Science in Statistics. The degree program is designed to qualify students for professional positions in industry, research,

government service, or graduate study in statistics or one of the quantitative fields of science.

The field of statistics presents methods of making decisions on the basis of probability. The baccalaureate program in statistics is intended to train a student to combine the scientific method with mathematics and inductive reasoning in order to serve on a research team as a member who can design experiments, analyze the results, and draw inference from them.

Students interested in a career in actuarial science should complete Stat. 261 and 262 during their junior years and Stat. 361 and 362 during their senior years.

Admission Requirements

Pre-Statistics Program of Study

General requirements for admission to the pre-Statistics program of study are that all prospective students must qualify for admission to WVU and to the College of Arts and Sciences and present secondary-school credit for 2 units of algebra, 1 unit of geometry, and ½ unit of trigonometry or advanced mathematics or 1 unit of chemistry or physics.

Additional Admission Requirements: Applicants must take the Standard ACT test and automatic admission to pre-Statistics will be based on the following:

West Virginia residents must satisfy any two of the requirements (a), (b), and (c) as herein described: (a) a high school grade-point average of at least 3.0; (b) a Standard ACT Mathematics Score of at least 22; and (c) a Standard ACT Composite Score of at least 22.

Out-of-State residents must satisfy any two of the requirements (d), (e), and (f) as herein described: (d) a high school grade-point average of at least 3.5; (e) a Standard ACT Mathematics Score of at least 24; and (f) a Standard ACT Composite Score of at least 24.

Applicants not satisfying these admission requirements may gain admission to Pre-Statistics as transfer students as described below.

Transfer Students: Students wishing to transfer into pre-Statistics must satisfy WVU admission requirements, Arts and Sciences admission requirements, and as a minimum: (1) Have a grade-point average of at least 3.0 for all college-level work attempted, and (2) Have earned at least a C in Math. 15 and 16 and have at least a 2.5 grade-point average on all computer science, mathematics, and statistics course work attempted.

The number of transfer students accepted into the department will be governed by the enrollment capacities of the degree programs. First admission priority will be granted to those students currently matriculated at WVU; second priority to students enrolled in statistics curricula at external colleges and universities; third priority to students enrolled in other degree programs at external colleges and universities. Within the last two priorities, preferential admission will be in the following order: West Virginia residents, U.S. citizens or permanent residents, and international students.

Statistics Degree Program

Statistics majors need at least a 2.5 grade-point average in all computer science, mathematics, and statistics courses attempted during the first two years of study to be admitted to the Bachelor of Science degree program in statistics. At a minimum this should include C.S. 1 and 2; Math. 15 and 16; and Stat. 201 and 212. Students not meeting these minimum requirements, but who display special aptitude for statistics, may request admission to the department on a provisional basis. Petitions should be addressed to the Statistics Academic Standards Committee and delivered to the department.

Degree Requirements

Statistics majors must complete at least 60 hours of upper-division course work with at least 35 of these upper-division hours in statistics, computer science, and mathematics. At least 26 of these 35 hours must be in statistics. A student must have at least a C in all courses counted towards meeting the 35 upper-division hours in statistics, computer science, and mathematics.

Required Courses are as follows: Math. 15, 16, 17, 241; C.S. 1, 2; Stat. 196, 197, 201, 212, 213, 261, 262; three of the following: Stat. 221, 231, 251, 291, 341, 351, 371, 381; 6 additional hours of upper-division course work in mathematics, statistics, and/or computer science, and at least 60 hours of upper-division course work.

No more than 6 hours of 190-199 course work may be used in fulfilling the 35-hour, upper-division requirement in statistics, computer science, and mathematics; no more than 10 hours of 190-199 course work in any field may be used in fulfilling the 60-hour, upper-division requirement.

Recommended Electives: Any course listed above and Stat. 190, 195, 361, 362; C.S. 50, 51, 120, 220, 221, 230, 240, 260, 270; Math. 113, 163, 213, 251, 252, 255; E.E. 201; I.E. 250.

Courses of Instruction in Statistics (Stat.)

Upper Division

101. *Elementary Statistical Inference.* I, II. 3 hr. PR: Math. 3. Basic concepts of descriptive and inferential statistics; descriptive measures, random variables, sampling distributions, estimation, tests of hypotheses, chi-square tests, regression and correlation. *(Equiv. to Econ. 125.)*

190. *Teaching Practicum.* I, II, S. 1-4 hr. (May be repeated for a maximum of 6 hr.) PR: Stat. 212, 261. Practical classroom experience for undergraduate teaching assistants. Tasks assigned are those designed to provide experience with course design, implementation, evaluation, and revision of classroom work.

191. *Special Topics.* I, II, S. 1-6 hr. Advanced study of special topics in statistics.

195. *Field Experience.* I, II, S. 1-18 hr. PR: Stat. 262 or equiv. *(Total credit applicable to any Arts and Sciences degrees may not exceed the maximum of 18 hours.)* Course for those who wish to work with faculty and field supervisors to design field experiences with planned learning objectives and credit goals.

196. *Statistics Seminar.* II. 1 hr. PR: Student must be a Statistics major. Satisfactory completion of the course requires that the student present a 20- to 50-minute talk on a selected topic and attend all scheduled meetings.

197. *Statistics Practicum.* I. 1 hr. PR: Stat. 201 and C.S. 1; open to Statistics majors only. Analysis of actual experiments using a computer under supervision of a faculty member.

201. *Introduction to Probability and Statistics.* I, II. 3 hr. PR: Math. 15. Probability, random variables, discrete and continuous probability distributions. Expected value, moment generating function, functions of random variables. Confidence intervals, tests of hypotheses, chi-square tests. Linear regress and correlation.

212. *Intermediate Statistical Methods.* I, II. 3 hr. PR: Stat. 101 or 201 or equiv. Extension of basic concepts of statistical inference: estimation and hypothesis testing for more than two populations, multiple regression and correlation, curvilinear regression, analysis of variance and covariance.

213. *Introductory Design and Analysis.* II. 3 hr. PR: Stat. 212. Introduction to the linear model, the complete and fractional factorial experiment, and the completely random, randomized complete block, Latin square, and split-plot experimental designs.

221. *Statistical Analysis System (SAS).* I, II. 3 hr. PR: Stat. 101 or 201 or equiv., and C.S. 1 or equiv. Introduction to the use of the Statistical Analysis System (SAS), a statistical computer program. Students will perform statistical data analysis, data file modifications, and statistical report writing.

231. *Sampling Methods.* I. 3 hr. PR: Stat. 101 or 201 or equiv. Methods of sampling from finite populations, choice of sampling unit and sample survey design. Estimation of confidence limits and optimum sample size. Single and multistage sampling procedures.

251. *Data Analysis.* II. (Alternate Years.) 3 hr. PR: Stat. 213. Computer analyses of simulated or real unbalanced data using a matrix approach to linear models. The techniques will include least squares analysis of variance and covariance, multiple, and polynomial regression, and multiple discrimination. *(Course will not be offered in 1986-87.)*

261. *Statistics and Probability 1.* I. 3 hr. PR: Math. 16. Events, random variables, discrete and continuous probability distributions. Expected value, moment generating functions, special probability distributions. Random sampling and distributions of certain functions of random variables. The Central Limit Theorem.

262. *Statistics and Probability 2.* II. 3 hr. PR: Stat. 261. Introduction to statistical inference. Properties of estimators and techniques of estimation. Hypotheses testing including the Neyman-Pearson Lemma and likelihood ratio tests. Regression and correlation including least squares. Selected topics.

264. *Fundamentals of Statistical Theory.* II. 3 hr. PR: Math. 16 or equiv., and Stat. 101 or 201 or equiv. Random variables and their probability distributions. Properties of estimators and methods of estimation. Principles of hypotheses testing. *(Course will not be offered in 1986-87.)*

291. *Topics in Statistics.* I, II, S. 3 hr. PR: Stat. 201 or equiv. Advanced study of topics in statistics.

300. *Statistical Package: Social Sciences.* I. 2 hr. PR: Stat. 311 or equiv. Introduction to the use of the Statistical Package for the Social Sciences (SPSS), a statistical computer program. *(Course will not be offered in 1986-87.)*

311. *Statistical Methods 1.* I, II. 3 hr. PR: Math. 3. Statistical models, distributions, probability, random variables, tests of hypotheses, confidence intervals, regression, correlation, transformations, F and Chi-square distributions, analysis of variance and multiple comparisons. *(Equiv. to Ed. P. 311 and Psych. 311.)*

312. *Statistical Methods 2.* I, II. 3 hr. PR: Stat. 212 or 311 or equiv. Completely random, randomized complete block, Latin square and split-plot experimental designs. Unplanned and planned multiple and orthogonal comparisons for qualitative and quantitative treatments and factorial arrangements. Multiple linear regression and covariance analysis. *(Equiv. to Ed. P. 312 and Psych. 312.)*

313. *Design of Experiments.* II. 3 hr. PR: Stat. 312 or equiv. Expected mean squares, power of tests and relative efficiency for various experimental designs. Fixed, random, and mixed models. Use of sub-sampling, covariance and confounding to increase power and efficiency.

341. *Applied Multivariate Analysis.* I. 3 hr. PR: Stat. 212 or 311 or equiv. Introduction to Euclidean geometry and matrix algebra; multiple and multivariate regression including multiple and canonical correlation; the k-sample problem including discriminant and canonical analysis; and structuring data by factor analysis, cluster analysis, and multidimensional scaling.

351. *Applied Regression Analysis.* I. 3 hr. PR: Stat. 312. Matrix approach to linear and multiple regression, selecting the "best" regression equation, model building, and the linear models approach to analysis of variance and analysis of covariance.

361. *Theory of Statistics* 1. I. 3 hr. PR: Math. 17. Probability and random variables, univariate and multivariate distributions, expectations, generating functions, marginal and conditional distributions, independence, correlation, functions of random variables including order statistics, limiting distributions, and stochastic convergence.

362. *Theory of Statistics* 2. II. 3 hr. PR: Stat. 361. Techniques of point and interval estimation, properties of estimates including bias, consistency, efficiency, and sufficiency; hypothesis testing including likelihood ratio tests and Neyman-Pearson Lemma; Bayesian procedures, analysis of variance and nonparametrics.

371. *Introduction to Exploratory Data Analysis.* I. (Alternate Years.) 3 hr. PR: An introductory statistics course. Basic ways in which observations given in counted and measured form are approached. Pictorial and arithmetic techniques of display and discovery. Methods employed are robust, graphical, and informal. Applications to social and natural sciences.

381. *Nonparametric Statistics.* II. 3 hr. PR: Stat. 311 or equiv. Distribution-free procedures of statistical inference. Location and scale tests for homogeneity with two or more samples (related or independent); tests against general alternatives.

Women's Studies

Degree Conferred: No degree conferred. Certificate.
Contact: Judith G. Stitzel, *Director*, 293-2339
200 Clark Hall.

Faculty

Judith G. Stitzel, Ph.D. (U. Minn.)—*Director of Women's Studies and Professor of English.* Feminist pedagogy, Women in development.

Nature of Program

The WVU Women's Studies Program was established in 1980 as an interdisciplinary program within the College of Arts and Sciences, serving the entire University. The Program is now administered through the Center for Women's Studies established in 1984 within the office of the Vice President for Academic Affairs and Research.

The basic premise of the Women's Studies Program is that the study of women is fundamental to our knowledge of humankind and that the inclusion of women's experiences and achievements in the curriculum is central to a liberal arts education. In support of this premise, the program stimulates, facilitates, and coordinates teaching and research on past and present realities and assumptions about women and men in society and culture.

A full description of academic opportunities, certificate and degree options, and other activities available through the Center for Women's Studies may be found on pages 451-452.

College of Business and Economics

The College of Business and Economics was founded in November of 1951 and graduated its first class in the spring of 1952. Since that time, the College of Business and Economics has become one of the largest colleges at West Virginia University.

The College of Business and Economics prepares students to work in business firms and other complex organizations. Whether you intend to operate a small firm or expect to join a large corporation, your program in business and economics will help you develop managerial skills.

A well-rounded selection of liberal arts courses contributes to your personal development. Courses such as statistics and business English assist you with your upper-division course load and are also helpful in your career. Special fields of interest are accounting, economics, finance, management, and marketing. Flexibility with electives allows you to strengthen your program in special areas.

Teaching methods used in the College of Business and Economics include lectures, laboratories, cases, guest lecturers, field trips, and internships. Closed-circuit video, telelecture, and other modern teaching techniques supplement class work.

Accreditation

The College of Business and Economics is accredited through the approval of WVU by national and regional accrediting agencies. In addition, in 1954 the College of Business and Economics was first accredited by the American Assembly of Collegiate Schools of Business. It is accredited through full membership in the American Assembly of Collegiate Schools of Business. Of the more than 1,200 business programs, only 241 programs are accredited at the undergraduate level. The College of Business and Economics is one of only 207 institutions accredited at both the graduate and undergraduate level and the only accredited program in West Virginia. The assembly is the only accrediting agency in the field of professional education for business at the collegiate level.

Admission

High-school students interested in professional careers in accounting, economics, finance, management, or marketing should seek admission in the Pre-Business and Economics Program in the College of Arts and Sciences.

On-campus students and transfer students who matriculated at an institution of higher learning in or after August, 1986, may seek admission into the College of Business and Economics upon completion of 58 or more credit hours, attainment of a 2.5 or better grade-point average, and completion of each of the following with a C grade or better: 6 hours of Principles of Economics, 6 hours of Accounting Principles, 3 hours of College Algebra, and 3 hours of Statistics. In addition, prior to formal admission into the College, students must successfully complete 3 hours of Introduction to Calculus and 6 hours of Composition and Rhetoric.

The foregoing are minimum requirements. All students meeting the specific requirements may not be guaranteed admission into the College. Limitations on entry may be necessary depending upon the adequacy and the availability of faculty, other resources, and space.

A formal application must be submitted to the College by students seeking admission and will be reviewed to determine eligibility and acceptability.

High school graduates interested in professional programs in business administration and economics must meet the minimum requirements for admission to WVU. Prospective students should file applications with the Office of Admissions and Records and stipulate the "Pre-Business and Economics Programs."

Additional information concerning admissions, fees and expenses is in Part 2 of the *Undergraduate Catalog*. Academic information is in Part 3.

Administrative Officers

Arthur Kraft, Ph.D. (SUNY—Buffalo), *Dean.*
Tom S. Witt, Ph.D. (Wash. U.—St. Louis), *Associate Dean.*
Donald R. Adams, Jr., Ph.D. (U. Penn), *Chairperson, Department of Economics.*
Vance Q. Alvis, Ph.D. (U. Va.), *Director, Graduate Economics Program.*
Lewis C. Bell, Ph.D. (U. Ky.), *Executive Director, West Virginia Council on Economic Education.*
Thomas L. Blaskovics, Ph.D. (U. Wisc.), *Director of Computing Services.*
Jay M. Bucklew, M.B.A. (WVU), *Assistant Dean, Administration.*
Jay H. Coats, Ph.D. (U. Pitt), *Director, Graduate Program in Public Accountancy.*
Randyl D. Elkin, Ph.D. (Iowa St. U.), *Chairperson, Department of Industrial and Labor Relations; Director, Graduate Industrial and Labor Relations Program.*
Jack A. Fuller, Ph.D. (U. Ark.), *Chairperson, Department of Management.*
Susan Gustin, B.A. (Duquesne U.), *Director, Undergraduate Advising Center.*
Stanley Kloc, M.B.A. (WVU), *Director, Small Business Development Center.*
Cyril M. Logar, D.B.A. (Kent St. U.), *Chairperson, Department of Marketing.*
Robert S. Maust, C.P.A., M.S. (WVU), *Director, Graduate Business Administration Program.*
Gail A. Shaw, C.P.A., Ph.D. (U. Mo.), *Chairperson, Department of Accounting.*
Fredrick C. Scherr, Ph.D. (U. Pitt), *Chairperson, Department of Finance.*
Tom S. Witt, Ph.D. (Wash. U., St. Louis), *Director, Bureau of Business Research.*

Faculty

Accounting

Professors

Jay H. Coats, Ph.D. (U. Pitt). Cost/managerial accounting, Microcomputers in accounting, Accounting education.
Robert S. Maust, M.S. (WVU). Financial accounting, Accounting theory, Managerial and cost accounting.
Adolph Neidermeyer, Ph.D. (U. Iowa). Federal/state income taxation, Estate planning, Financial accounting.
Gail A. Shaw, Ph.D. (U. Mo.)—*Chair.* Financial accounting theory, Auditing, Federal/state estate taxation.
G. Stevenson Smith, Ph.D. (U. Ark.). Not-for-profit and governmental accounting, Managerial accounting, Federal/state estate taxation.
Pierre L. Titard, Ph.D. (LSU). Financial accounting, Managerial accounting, Accounting education.

Associate Professors

Ann B. Pushkin, Ph.D. (VPI&SU). Auditing, Accounting information systems, Microcomputer applications.
Charles P. Skaggs, M.S. (WVU). Federal/state income estate taxation.

Assistant Professors

Jeffrey C. Dyer, J.D. (WVU)—*Visiting.* Federal income taxation, Estate planning.
Kenneth L. Paige, Ph.D. (U. Pitt). Financial and managerial accounting, Not-for-profit accounting.

Economics

Professors

Donald R. Adams, Jr., Ph.D. (U. Penn)—*Chair.* American economic history, European economic history, Economic development.

Vance Q. Alvis, Ph.D. (U. Va.). Money and banking, International economics, Public finance.

Lewis C. Bell, Ph.D. (U. Ky.). Public finance, Economics education.

Robert D. Britt, Ph.D. (U. Colo.). Managerial economics, History of economic thought, Economic history.

Ming-jeng Hwang, Ph.D. (Tex. A&M U.). General theory, Urban and regional economics, Mathematical economics.

Andrew W. Isserman, Ph.D. (U. Penn). Regional economics.

Arthur Kraft, Ph.D. (SUNY). Financial institutions, Human resources economics, Money and banking.

Kern O. Kymn, Ph.D. (U. Chicago). General theory, Mathematical economics, Econometrics.

Walter C. Labys, Ph.D. (U. Nottingham)—*Adjunct.* Commodity market modeling, Mineral economics, Econometrics.

Patrick C. Mann, Ph.D. (Ind. U.). Utility economics, Industrial organization.

Tom S. Witt, Ph.D. (Wash. U.—St. Louis). Econometrics, Energy economics, Regional economics.

Associate Professors

Jagdeep Bhandari, Ph.D. (SMU). International finance, International trade, Economic development.

Stuart Dorsey, Ph.D. (Wash. U.—St. Louis). Labor economics, Monetary theory, Fiscal policy.

Clifford B. Hawley, Ph.D. (Duke U.). Labor economics, Microeconomics theory, Econometrics.

Douglas Mitchell, Ph.D. (Princeton U.)—Monetary theory, Macroeconomics theory.

Assistant Professors

Paul Beaumont, Ph.D. (U. Penn)—*Visiting.* Econometrics, Regional economics.

Christopher Cornwell, Ph.D. (Mich. St. U.). Econometrics, Labor economics, Public finance.

Brian J. Cushing, Ph.D. (U. Md.). Urban and regional economics, Econometrics, Public finance.

Adrian H. Dierx, Ph.D. (U. Pitt). Urban and regional economics, Econometrics.

Parviz Jenab, Ph.D. (Ind. U.). Economic development, International economics.

Morteza Rahmatian, Ph.D. (U. Wyo.). Resource economics, Environmental economics, Microeconomic theory.

Peter Rupert, M.A. (U. Rochester). Labor economics, Microeconomic theory, International economics.

Paul J. Speaker, Ph.D. (Purdue U.). General theory, Econometrics, Finance.

William Trumbull, Ph.D. (U. N.C.). Public finance, Law and economics, Applied microeconomics.

Royce J. Watts, M.S. (WVU). Statistics.

Finance

Professors

Arthur Kraft, Ph.D. (SUNY). Financial institutions, Human resource economics, Money and banking.

Joseph Newhouse, M.S. (WVU). Investments, Capital markets and institutions.

Anthony Tuberose, Ph.D. (U. Tex.). Corporate finance, Investments.

Associate Professors

Howard Brewer, Ph.D. (U. Iowa). Capital markets and institutions, Investments.

George E. Moody, D.B.A. (Ind. U.). Real estate, Corporate finance.

William B. Riley, Ph.D. (U. Ark.). Investments, Capital markets and institutions.

Terry L. Rose, Ph.D. (U. Ill.). Insurance, Real estate.

Frederick C. Scherr, Ph.D. (U. Pitt)—*Chair.* Corporate finance, Capital markets and institutions.

Assistant Professors

Don P. Holdren, Ph.D. (U. Nebr.). Capital markets and institutions, Investments.
Timothy Sugrue, Ph.D. (U. Mass.). Corporate finance, Capital markets and institutions.

Industrial and Labor Relations

Professors

Robert L. Decker, Ph.D. (Carnegie-Mellon U.). Industrial psychology, EEO-affirmative action testing and validation interviewing.
Randyl D. Elkin, Ph.D. (Iowa St. U.). *Chair.* Collective bargaining, Arbitration, Healthcare bargaining.
Richard W. Humphreys, Ph.D. (U. Wisc.). Labor-management cooperation, Benefits, Work measurement.
Robert Miller, Ph.D. (Ohio St. U.)—*Adjunct.* Labor-management cooperation, Quality of worklife, Evaluation of planned social change.
Dietrich L. Schaupp, D.B.A. (U. Ky.). Organizational performance and development, Labor-management cooperation.
Fred A. Zeller, Jr., Ph.D. (Ohio St. U.). Labor-management relations, Economic development, Human resources.

Associate Professors

John Grasso, Ph.D. (Ohio St. U.). Vocational education programs, Mine training and certification, Management information systems.
Wilbur J. Smith, M.S. (U. Wisc.). Human resource economics, Employment and training programs, Labor force.
Owen A. Tapper, M.S. (U. Wisc.). Trade unionism, Safety and health, Labor management cooperation.

Management

Professors

Jack A. Fuller, Ph.D. (U. Ark.)—*Chair.* Heuristic decision making, Production planning and control, Systems analysis and design.
Dietrich L. Schaupp, D.B.A. (U. Ky.). Organizational performance and development, Labor-management cooperation.
Daniel F. Twomey, D.B.A. (Kent St. U.). Small business/industrial, Conflict management, performance appraisal, Organizational change.

Associate Professors

Thomas L. Blaskovics, Ph.D. (U. Wisc.). Management information systems, Psychological testing.
John Harpell, D.B.A. (Ga. St. U.). Operations research, Mentorship, Production management.
Charles E. Hooper, Ed.D. (WVU). Behavior management.
Ali Mansour, Ph.D. (U. Ga.). Management information systems, Behavior management, Ethics.

Assistant Professors

Joyce Beggs, Ph.D. (U. Tenn.). Strategic management, Not-for-profits management, Labor relations.
Sevket Gunter, M.A. (U. Rochester). Production scheduling, Bidding, Management science.
Michael Lane, D.B.A. (Memphis St. U.). Business policy strategic planning, Small business planning.
Shi-Chu Lin, Ph.D. (U. Rochester). Production planning, Scheduling, Inventory control.
Linda Sypolt, J.D. (WVU). Copyright/patents, Labor law.

Instructor

George Markusic, J.D. (WVU). Business law.

Lecturers
Richard M. Gardner, M.B.A. (WVU). Budgeting.
Stanley J. Kloc, M.B.A. (WVU). Small business management, Business research.
Joy Peluchette, M.S.I.R. (WVU). Human resources, Industrial and labor relations.

Marketing

Professor
Cyril M. Logar, D.B.A. (Kent St. U.)—*Chair.* Health care marketing, Strategic marketing planning, Marketing research.

Associate Professors
Robert Conner, M.B.A. (WVU). Small business.
Robert Cook, D.B.A. (Kent St. U.). Sales management.
Philip Mahin, M.B.A. (U. Penn). Industrial marketing and sales management.
Terry Wilson, Ph.D. (Mich. St. U.). Services marketing, Marketing planning.

Assistant Professors
Patricia Goeke, M.B.A. (WVU). Marketing research, Tourism and economic development.
Gordon McClung, M.B.A. (WVU). Consumer behavior and advertising, Marketing strategy and policy.
Thomas Ponzurick, D.B.A. (Memphis St. U.). Services marketing, Transportation, Health care and entertainment-related services.

Instructor
Jay M. Bucklew, M.B.A. (WVU)—Promotion, Advertising, Sales promotion.

Lecturer
John L. Porter, M.B.A. (WVU). Retail management.

Prerequisites for Upper-Division, Undergraduate Business Courses

To enroll in any upper-division, undergraduate business course offered by the College, the undergraduate student must have completed: 6 hours of Principles of Economics, 6 hours of Accounting Principles, 3 hours of Statistics, Mathematics 3 or Mathematics 14, and 3 hours of Calculus (Mathematics 128 or Mathematics 15). Exceptions to the above policy must be approved by the chairperson of the department offering the course.

Work Taken at Other Institutions

Students who expect to obtain a degree from the College of Business and Economics and who wish to take work at other institutions must have their programs approved by the Dean of the College of Business and Economics before registering at another institution of higher learning. Ordinarily required courses must be taken at WVU.

Maximum and Minimum Load

A minimum of 12 hours in a semester is required for full-time status in the College of Business and Economics. The maximum load is 18 hours in the College. Exceptions to the minimum or maximum load require approval of the Academic Standards Committee of the College before registration. Students seeking to withdraw from individual courses must petition the Committee on Academic Standards whenever the remaining load falls below the required minimum even though all other conditions supporting the request for the individual course withdrawal may be in order.

Individual Class Withdrawal Policy

While Computer Science 5 is not a prerequisite course for admission to the College, it is a critical course that is vital to a variety of upper-division business and economics courses. As a matter of policy, requests by students who are enrolled in the College to drop C.S. 5 will not be honored.

Bureau of Business Research

The Bureau of Business Research is the formal research division of the College of Business and Economics. Various projects and programs are conducted and administered by the bureau, many of which are funded through grant and contract relationships with other organizations, both private and governmental. Basically, the bureau serves three interrelated functions—research, information services, and publication.

One of its missions is to identify research needs and opportunities, with special concern for those related to the economic problems of the Appalachian region. Appropriately, much of the recent grant-supported activity has dealt with three areas of concern to West Virginia—the development of travel and tourism, health care problems, and energy. Along with valuable data on current needs, students are provided with opportunities for training in research methods. Direct access to the West Virginia Network for Educational Telecomputing (WVNET) on Chestnut Ridge Road in Morgantown is provided through a terminal housed within the bureau.

The bureau also serves as a reseach center through its reference library of books and periodicals on business and economics, and responds continually to requests for statistical and economic information. As a member of the Association for University Business and Economic Research, the bureau receives many of the publications of research organizations at other universities, thus maintaining an up-to-date file of current research in the fields of business and economics.

Two scholarly publications of the bureau are the quarterly *Journal of Small Business Management*, having an international circulation, and the annual *Bibliography of the Association for University Business and Economic Research*. In addition, the bureau carries out a publication program which includes faculty working papers in both business and economics, plus various other works.

The Bureau also conducts research and provides management assistance and information services through its recently established Small Business Development Center, which is part of the state SBDC network. In this capacity, the unit serves as a focal point for the coordination of federal, state, local, university, and private resources to aid in the initiation and development of small businesses throughout the state.

The Center for Economic Analysis and Statistics (CEAS) analyzes economic data pertaining to West Virginia and will recommend ways to obtain information necessary to improve economic development strategies. The CEAS draws on the expertise of economists, statisticians, and graduate students to conduct its research and service projects.

Institute of Industrial and Labor Relations

The Institute of Industrial and Labor Relations conducts interdisciplinary research and public service activites dealing with labor management-relations.

Multiple Bachelor Degrees

Concurrent Bachelor's Degrees

If students are seeking to earn two bachelor's degrees simultaneously or concurrently, and if one of the two to be earned includes a Bachelor of Science in Business Administration or Economics, then they must meet all requirements leading to either undergraduate degree offered by the College of Business and Economics.

The student must complete all University Core Curriculum requirements, all College of Business and Economics Core requirements, and must satisfy the course requirements of one of the College of Business and Economics curricula. (See "Requirements for Degrees.") Students seeking to earn a Bachelor of Science in Business Administration or Economics and another bachelor's degree simultaneously must earn at least 30 hours in addition to the minimum of 128 hours required by the college. (See "Second Bachelor's Degree" in Part 3 of the *Undergraduate Catalog*.) Students seeking a Bachelor of Science in Business Administration or Economics and another bachelor's degree simultaneously are required to earn at least 30 hours of credit while enrolled in the College of Business and Economics, and in residence.

In addition, students seeking a Bachelor of Science in Business Administration or Economics and another degree simultaneously must meet all admission requirements in order to be enrolled in the College of Business and Economics.

Successive Bachelor's Degree

A student who has received a bachelor's degree from an approved college or university may be eligible to enter the program for a second bachelor's degree in business administration or economics. This program is designed for persons who have already received a bachelor's degree in another field, who desire to strengthen themselves for careers in business and industry, and for those students who may wish to eliminate deficiencies and enhance their opportunities for graduate study. The required Business and Economics core leading to a second bachelor's degree in Business Administration comprises a minimum of 52 hours. The required Economics and Business core leading to a second bachelor's degree in Economics comprises 36 hours. A second degree candidate must complete *all* courses in the stipulated Business and Economics core and such other courses as the Dean may prescribe.

A student may complete a portion of the required Business and/or Economics core while earning the first undergraduate degree. However, candidates for the second bachelor's degree must complete a minimum of 30 semester hours of credit in courses in the College of Business and Economics while in residence in the college. Residency may be established only after the student documents receipt of the first bachelor's degree.

A student who has received a bachelor's degree from an approved college or university may be eligible to enter the College to complete a second bachelor's degree in business administration or economics provided the student has earned a 2.5 overall grade-point average while completing the first bachelor's degree and has successfully earned credit with a grade of C, or better for Economics 54 and 55, Accounting 51 and 52, Economics 125, and College Algebra. In addition, establishment of credit in Introduction to Calculus (Math. 128 or its equivalent) and 6 credit hours of English Composition and Rhetoric must also be completed prior to entering the College for the successive bachelor's degree in Business and Economics.

Requirements for Degrees

Bachelor's Degree

To qualify for either the Bachelor of Science in Business Administration or the Bachelor of Science in Economics, the student must have:

1. Earned 128 semester hours of credit with a 2.0 grade-point average (C) on all work attempted at WVU and state institutions under the jurisdiction of the West Virginia Board of Regents. In addition, all students are required to maintain at least a 2.0 average on all work attempted after admission to the College of Business and Economics (not merely WVU).

2. Students majoring in any of the areas of business or economics must average a 2.0 (C) or better from courses in their areas of concentration (excludes required or elective courses in other disciplines in business or economics).

3. Earned 128 semester hours of credit in subjects other than in Math. 2. A maximum of 6 hours of credit in advanced Military Science (ROTC) or 12 hours advanced Air Force Aerospace Studies (ROTC) will be allowed toward graduation and is counted as non-Business and Economics or unrestricted electives.

4. Earned at least 30 hours of credit while enrolled in the College of Business and Economics, and in residence.

5. Satisfied the requirements of the WVU Core Curriculum.

6. While the preceding constitutes the general requirements of the bachelor degrees of the College of Business and Economics, course requirements, specific grade requirements, and related academic requirements must be satisfied in one of the several curricula of the College of Business and Economics which follow.

Undergraduate Curricula

The College of Business and Economics offers two degrees—Bachelor of Science in Business Administration and Bachelor of Science in Economics. Programs leading to these degrees are designed to enable students to obtain a balanced selection of courses in liberal arts, a broad base of study in business and economics, and concentrated work in major areas of interest.

Bachelor of Science in Business Administration

The requirements for the Bachelor of Science in Business Administration are formulated in four parts: (1) 56 hours outside business and economics; (2) 9-12 hours of unrestricted courses in or out of the College of Business and Economics; (3) 36 hours in the common body of knowledge in business and economics; and (4) 24-27 hours in an area of concentration (accounting, finance, business management, or marketing) and in electives in business and economics with a career emphasis.

Since students interested in careers in business matriculate in the Pre-Business and Economics programs during their freshman and sophomore years, and since they transfer and matriculate in the College of Business and Economics in their junior and senior years, several vital dates and curricula requirements are cited below:

(a) Relative to pass-fail courses and grading, University regulations limit full-time junior and senior students to one course per semester or one course per summer session in free electives, excluding University Core Requirements, and cannot exceed a total of 16 hours of credit. The College of

Non-Business and Economics Core Courses	*Accounting, Finance, Management, and Marketing Majors* Hr.
Engl. 1 and 2—Composition and Rhetoric	6
Engl. 105—Business Communication	3
Core Group A Courses: Electives	12
Core Group B Courses:	
Psych. 1—Introduction to Psychology	3
Soc. & A. 1—Introduction to Sociology	3
Other Group B Electives (Non-economics)	6
Core Group C Courses:	
Math. 3—College Algebra	3
Math. 128—Introduction to Calculus	3
C.S. 5—Computer Applications for Business	4
Other Group C Elective(s) (other than Stat. 101)	3
Other Electives—Non-Business and Economics	10
	56
Unrestricted Electives (in or out of the College of Business and Economics)*	9

All majors in business administration must complete a uniform body of common knowledge in business and economics consisting of 36 credit hours.

Required College Core Courses:	
Acctg. 51 and 52—Principles	6
Econ. 54 and 55—Principles	6
Econ. 125—Elementary Business and Economics Statistics	3
Manag. 101—Introduction to Business Information Systems	3
Manag. 105—Contemporary Management	3
B. Law 111—Legal/Ethical Environment of Business	3
Fin. 111—Business Finance	3
Manag. 111—Production and Quantitative Business Methods	3
Mrktg. 111—Introduction to Marketing	3
Manag. 225—Business Policy	3
	36
*Courses in Major Field (and electives)***	27
GRAND TOTAL	128

*Marketing majors must complete 12 hours of unrestricted electives.
**Marketing majors are required to complete 24 hours in their major field (and electives).

Business and Economics permits pass-fail grading in business or economics courses only under these conditions: (1) Pass-fail grading will be permitted only in courses numbered 200 (Special Topics) other than in the student's major area, and (2) in "free" electives in business and economics and only where the student has met all requirements (including business and economics "elective" requirements) and only where the course is not necessary to fulfill the various program and 128 credit degree requirements.

(b) Students majoring in any of the several areas of business must average a 2.0 (C) or better from courses in their areas of concentration (excludes required or elective courses in other disciplines in business or economics).

(c) Students who were admitted to an institution of higher education in the Fall of 1986, or later, and are making application for initial admission to the College or reapplying for initial admission to the College must complete 58

or more credit hours, attain a 2.5 or better cumulative grade-point average, and must complete each of the following courses with a grade of C or better: 6 hours of Principles of Economics, 6 hours of Accounting Principles, 3 hours of Statistics, and 3 hours of Mathematics 3 or Mathematics 14. In addition, students entering the College must successfully complete, before entering the College: English 1 and 2 and Mathematics 128.

(d) A maximum of 3 credit hours earned as a result of proctoring a self-paced undergraduate course, while the student is enrolled in the College of Business and Economics, may be applied towards the 128 credit hours required for the B.S.B.Ad. degree.

(e) The mathematics requirement for all students matriculating at an institution of higher education, Fall, 1986, or later, and then seeking admission as a business student to the College of Business and Economics, will be the completion of Mathematics 3 (College Algebra) with a grade of C or better and the completion of Mathematics 128 (Introduction to Calculus) with a passing letter grade. Completion of the designated mathematics courses at the appropriate grade level must be established prior to the business student gaining formal admission to the College. (Credit established by the student in Mathematics 15 and 16 would meet the mathematics requirement. A grade of C or better in Mathematics 14 [Pre-Calculus Mathematics] established by the student seeking admission to the College as a business student would be acceptable in lieu of Mathematics 3.) The mathematics requirement is in addition to all other requirements already established and must be met prior to the formal admission of the undergraduate business student into the College.

Accounting Majors

Advanced work in accounting provides both specialized knowledge in accounting and financial reporting and an integrated overview of the economic activities of a business entity. Advanced accounting courses prepare students for a variety of positions in accounting, business, and financial management, such as controllers, financial officers, certified public accountants, managerial accountants, internal auditors, tax accountants, public administrative officers, and other executives.

	Hr.
Acctg. 111 and 112—Intermediate Accounting	6
Acctg. 115—Cost Accounting	3
Acctg. 200—Special Topics: Fall—Microcomputers in Accounting	1
Acctg. 210—Advanced Accounting	3
Acctg. 211—Accounting Systems, or Acctg. 217—Auditing Theory	3
Acctg. 213—Income Tax Accounting	3
B. Law 200—The Law and the C.P.A.	3
Econ. 130—Money and Banking, or Fin. 151—Financial Institutions	3
Business and Economics Electives	2
	27

Mathematics 128, Introduction to Calculus (Core C), is required of all Accounting majors whose first college matriculation was in August, 1982, or later.

A grade of A or B in Accounting 52 is required of all students prior registering for Accounting 111.

Students contemplating C.P.A., C.M.A., or C.I.A. examinations should take both Accounting 211 and 217.

Accounting majors must earn a grade of C or better in Accounting 111 before proceeding to Accounting 112 and a grade of C or better in Accounting 112 prior to graduation.

The accounting major is not intended to prepare students for bookkeeping positions. The program is designed to prepare students to pass the professional examinations (CPA, CIA, CMA) and assume supervisory positions.

Accounting seniors are urged to contact the Board of Accountancy in the specific state in which they are planning to sit for the C.P.A. examination. Certain states require additional accounting hours to sit for the C.P.A. examination (i.e., Florida requires a 5-year accounting program; Texas requires 30 hours in accounting courses). The departmental office has the addresses of all state boards of accountancy.

Career Paths in Accounting

Careers in accounting include industrial, public, and governmental accounting. While accounting and potential accounting majors are urged to consult with the faculty relative to the opportunities and the preparation desirable in the several career areas, recommendations or guidelines are listed below in assisting students in the selection of electives in accounting, other business areas, economics and outside courses which will prepare students better for the several career paths and professional examinations in accounting.

Public Accounting

The following courses are recommended. However, there is no guarantee that these courses will be offered while the student is in attendance at WVU. The offering of courses is subject to availability and it cannot be guaranteed that recommended courses ever will be offered.

The following courses are recommended for selection as electives for students preparing for careers in public accounting:

Business and Economics Electives:

- Acctg. 200—Special Topics
- Acctg. 211—Accounting Systems
- Acctg. 214—Income Tax Accounting
- Acctg. 217—Auditing Theory
- Fin. 112—Financial Management
- Fin. 115—General Insurance
- Fin. 150—Investments
- Fin. 212—Working Capital Management
- Fin. 250—Security Analysis
- Econ. 211—Intermediate Microeconomic Theory
- Econ. 225—Applied Business and Economic Statistics
- Econ. 245—Government and Business

Non-Business and Non-Economics Electives:

- Engl. 8—Intermediate Composition
- Engl. 108—Advanced Composition
- C.S. 2—Computer Language Concepts

Industrial Accounting

The following courses are recommended. However, there is no guarantee that these courses will be offered while the student is in attendance at WVU. The offering of courses is subject to availability and it cannot be guaranteed that recommended courses ever will be offered.

The following courses are recommended for selection as electives for students preparing for careers in industrial accounting:

Business and Economics Electives:
- Acctg. 200—Special Topics.
- Acctg. 211—Accounting Systems
- Acctg. 214—Income Tax Accounting
- Acctg. 216—Advanced Managerial Accounting
- Acctg. 217—Auditing Theory
- Fin. 112—Financial Management
- Fin. 150—Investments
- Fin. 212—Working Capital Management
- Fin. 250—Security Analysis and Portfolio Management
- Manag. 111—Production and Quantitative Business Methods
- Econ. 160—Labor Economics
- Econ. 211—Intermediate Microeconomic Theory
- Econ. 225—Applied Business and Economic Statistics
- Econ. 245—Government and Business

Non-Business and Non-Economics Electives:
- Engl. 8—Intermediate Composition
- Engl. 108—Advanced Composition
- I.E. 20—Fundamentals of Industial Engineering

Governmental Accounting

The following courses are recommended. However, there is no guarantee that these courses will be offered while the student is in attendance at WVU. The offering of courses is subject to availability and it cannot be guaranteed that recommended courses ever will be offered.

The following courses are recommended for selection as electives for students preparing for careers in governmental accounting:

- Acctg. 200—Special Topics
- Acctg. 211—Accounting Systems
- Acctg. 214—Income Tax Accounting
- Acctg. 216—Advanced Managerial Accounting
- Acctg. 217—Auditing Theory
- Fin. 150—Investments
- Econ. 225—Applied Business and Economics Statistics
- Econ. 241—Public Finance
- Econ. 245—Government and Business

Non-Business and Non-Economics Electives:
- Engl. 8—Intermediate Composition
- Engl. 108—Advanced Composition

Management Majors

Students interested in personnel, human resources management, management information systems, operations management, production, planning or in administrative and supervisory positions will find management the appropriate major.

A student majoring in management must arrange a program around one of two options: Administrative Science or Decision Science.

Students learn concepts, develop managerial skills in leadership, motivation, communications, decision making, and policy formulation. Simultaneously, they develop quantitative analysis and information processing abilities. Students also learn about the functional areas of human resources and production; and about the design, structure, and strategy of profit and

nonprofit organizations; large and small businesses; and national and multinational corporations.

Administrative Science Option

Career opportunities for students in the administrative science option include:

Human Resource Management—There is a growing demand for specialists in the personnel area. Typical early positions are personnel staff specialist, training director, wage and salary specialist, employment manager, benefits analyst, and industrial relations supervisor.

General Management—Typical early positions are: department manager, merchandise manager, credit and collections manager, director of public relations, and community organization director.

Organizational Development—Typical early positions are: training specialist, training director, employee development specialist, personnel staffing specialist, and change agent.

Planning and Strategy—Typical early positions are: systems analysis, management trainee, assistant to the president, manager of manpower planning, and planning specialist.

Administrative Science Program	*Hr.*
Acctg. 116—Managerial Accounting	3
Manag. 201—Business Information Systems	3
Manag. 205—Individual and the Organization	3
Manag. 206—Organization Theory	3
Manag. 216—Personnel Management	3
B. Law 112—Commercial Law	3
Business and Economics Electives	9
	27

Management majors following this option are urged to consult with faculty and follow the recommendations below in the selection of business, economics, and outside electives.

The following courses are recommended. However, there is no guarantee that these courses will be offered while the student is in attendance at WVU. The offering of courses is subject to availability and it cannot be guaranteed that recommended courses ever will be offered.

Recommended Business and Economics Electives:

- Manag. 200—Special Topics
- Manag. 213—Problems in Business Administration
- Manag. 217—Personnel and Compensation
- Manag. 218—Focal Points in Management
- Acctg. 216—Advanced Managerial Accounting
- Econ. 160—Labor Economics
- B. Law 211—Personnel Relations and the Law
- I.L.R. 262—Collective Bargaining and Labor Relations

Recommended Outside Electives:

- Pol. S. 140—Introduction to Public Administration
- Psych. 101—Leadership and Human Relations
- Psych. 151—Introduction to Social Psychology
- Soc. & A. 233—Sociology of Work and Work Places
- Spch. 221—Persuasion
- I.E. 222—Job Evaluation and Wage Incentives
- I.E. 280—Industrial Engineering Problems

Students should take a minimum of the foregoing from either their unrestricted electives, Group A or B requirements, or from other free outside electives.

Decision Science Option

Students with backgrounds in mathematics and/or statistics and those who desire to pursue the application of quantitative techniques to managerial decisions in considerable depth should enroll in this curriculum. Students selecting the decision science option will take courses emphasizing management science, operations research, systems analysis, organizational planning, industrial application of computer science, production or inventory planning and control, mathematics, statistics, and line positions in production.

Careers for students in the decision science option include the following positions: management information specialist, systems analyst, analyst trainee, industrial/production manager, operations systems manager, systems design specialist, industrial buyer, inventory control specialist, materials manager, purchasing research analyst, manufacturing supervisor, and quality control.

Decision Science Program	*Hr.*
Acctg. 116—Managerial Accounting	3
Manag. 201—Business Information Systems	3
Manag. 205—The Individual and the Organization	3
Manag. 210—Business Decision-Making Under Uncertainty	3
Manag. 211—Advanced Production Management	3
Manag. 220—Deterministic Decision Analysis	3
Business and Economics Electives	9
Total	27

Recommended Business and Economics Electives:

The following courses are recommended. However, there is no guarantee that these courses will be offered while the student is in attendance at WVU. The offering of courses is subject to availability and it cannot be guaranteed that recommended courses ever will be offered.

Econ. 225—Applied Business and Economics Statistics
Manag. 206—Organizational Theory and Analysis
Manag. 216—Personnel Management
Fin. 112—Financial Management
Mktg. 207—Business Logistics Management

Recommended Outside Electives:

Business management majors electing the personnel management option are particularly urged to choose a minimum of the courses listed below from either their Group A or B requirements, unrestricted electives, or free outside electives (as appropriate):

I.E. 113—Engineering Statistics	3
I.E. 140—Motion and Time Study	3
I.E. 222—Job Evaluation and Wage Incentives	3
I.E. 242—Production Planning and Control	3
I.E. 249—Design of Dynamic Materials Systems	3
I.E. 277—Engineering Economy	3
I.E. 280—Industrial Engineering Problems	1-3
Soc. & A. 233—Sociology of Work and Work Places	3
Stat. 231—Sampling Methods	3
Math. 143—Introduction to Linear Algebra	3
Math. 241—Applied Linear Algebra	3
C.S. 270—System Design	3
C.S. 281—Introduction to Artificial Intelligence	3
C.S. 310—Application Programming	3
C.S. 360—Design of Database Systems	3
C.S. 370—System Implementation	3

Spch. 80—Introduction to the Mass Media 3
Spch. 221—Persuasion 3

A careful examination of the 128-hour degree requirement reveals that a 22 credit-hour block of "outside elective" courses may be used to support the decision science option (22 hours: 3 hr. from Core C elective; 10 hr. from the "free" outside electives; and 9 hr. from the unrestricted area).

Students interested in the decision science program should consult with the management faculty as early as possible in their college careers, preferably at the freshman or sophomore stage. Electives should be selected from mathematics, computer science, statistics, and industrial engineering.

Finance Majors

The finance curriculum prepares students for a variety of positions in financial and non-financial enterprises. The finance function permeates every organization. Students are given an opportunity to select an area in finance with depth so they can pursue a career of their choice.

Five program options are as follows:

1. Commercial Bank and Financial Institutions Option.
2. Corporate Finance Option.
3. Insurance and Risk-Management Option.
4. Real Estate Option.
5. Security Markets and Investment Option.

This "revised" curriculum with various options was effective for all Finance majors admitted to the College of Business and Economics (not just WVU) on or after July, 1985.

The finance curriculum totals 27 hours and consists of 15 hours required of all finance majors (the "finance core") of general finance courses and 12 hours of specialized courses dependent upon the finance program option selected. The 15 required hours are:

	Hr.
Fin. 112—Financial Management	3
Fin. 115—General Insurance, *or* Fin. 161—Real Estate	3
Fin. 150—Investments	3
Fin. 151—Financial Institutions	3
Acctg. 116—Managerial Accounting	3
Total	15

Note: The prerequisite for Finance 112 is a grade of B or better in Finance 111.

Commercial Bank and Financial Institutions Option

Students who wish to follow a career in commercial banking or in other financial institutions should enroll in this curriculum. This area of concentration places emphasis on the operations, financing, and management functions of depository institutions. Concepts and skills to apply to the unique problems encountered in commercial banks, savings and loan associations, and other types of financial services institutions are developed in this program. The career path includes management opportunities in commercial banking, bank regulatory agencies, savings and loan associations, governmental agencies, credit unions, and sales and consumer finance companies.

Commercial Bank and Financial Institutions Program	Hr.
Fin. 251—Bank Management	3
Fin. 252—Advanced Bank Management	3
Business and Economics Directed Electives 1 (subject to availability)	
(3 hr. from list below)*	3
Fin. 212—Working Capital Management	3
Fin. 250—Security Analysis and Portfolio Management	3
Business and Economics Directed Electives 2 (subject to availability)	
(3 hr. from list below)*	3
Fin. 212—Working Capital Management	3
Fin. 250—Security Analysis and Portfolio Management	3
Fin. 262—Real Estate Finance	3
Acctg. 111—Intermediate Accounting	3
Total	12

*Finance 212 and 250 appear in the course lists for each directed elective. Each course may be used to satisfy one and only one directed elective.

Corporate Finance Option

This career path is for those students interested in a career in the financial administration of business firms, non-profit organizations and government agencies. The option emphasizes analytical tools for financial decisions for the above organizations.

Corporate Finance Program	Hr.
Fin. 212—Working Capital Management	3
Fin. 115—General Insurance, or Finance 161—Real Estate	
(whichever is not used to fulfill finance core requirements)	3
Business and Economics Directed Electives (subject to availability)	
(6 hr. from list below)	6
Fin. 216—Risk Management	3
Fin. 251—Bank Management	3
Fin. 262—Real Estate Finance	3
Fin. 317—Capital Budgeting (Special Approval)	3
Acctg. 213—Income Tax Accounting	3
Econ. 211—Intermediate Microeconomic Theory	3
Econ. 212—Intermediate Macroeconomic Theory	3
Econ. 225—Applied Business and Economics Statistics	3
Econ. 245—Government and Business	3
Manag. 210—Business Decision-Making Under Uncertainty	3
Total	12

Insurance and Risk-Management Option

This curriculum is designed for those students who are interested in the fields of insurance and risk management. Approximately two million people are employed in this industry nationally, and they are from every profession and business specialty. The best career opportunities are in underwriting, loss control, management, loss adjustment, data processing, accounting, sales, and marketing. Students interested in insurance should take Finance 115 as part of their finance core.

Insurance and Risk-Management Program	Hr.
Fin. 120—Life Insurance	3
Fin. 216—Risk Management	3
Business and Economics Directed Electives (subject to availability)	
(6 hr. from list below)	6
Fin. 161—Real Estate	3
Fin. 220—Social Insurance	3
Acctg. 111—Intermediate Accounting	3
Acctg. 112—Intermediate Accounting	3
B. Law 112—Commercial Law	3
B. Law 211—Personnel Relations and the Law	3
Manag. 216—Personnel Relations	3
Mrktg. 114—Personal Selling	3
Mrktg. 120—Promotion Management	3
Mrktg. 203—Sales Management	3
Total	12

Real Estate Option

Opportunities for professionals in real estate have increased sharply and appear promising in the decade ahead. The real estate option is designed to prepare students for careers in any of the following areas of real estate: marketing, appraising, developing, investing and mortgage lending. Students interested in Real Estate should take Finance 161 as part of their finance core.

West Virginia Real Estate Licensing. Finance 161, Real Estate, and an appropriate Business Law course fulfill the educational requirement for those taking the Real Estate Salesperson's examination. In addition, those students who may seek a Real Estate Broker's License should take Finance 261, Real Estate Appraisal, and Finance 262, Real Estate Finance.

This option is currently closed. In addition, there is no guarantee that any of the real estate courses will be offered while you are in attendance at WVU.

Real Estate Program	Hr.
Business and Economics Directed Electives 1	
(6 hr. from list below)	6
Fin. 261—Real Estate Appraisal	3
Fin. 262—Real Estate Finance	3
Fin. 263—Real Estate Investments	3
Business and Economics Directed Electives 2	
(6 hr. from list below)	6
Fin. 115—General Insurance	3
Fin. 216—Risk Management	3
Fin. 261, 262, 263 (whichever is not taken in fulfillment of list above)	3
Fin. 250—Security Analysis and Portfolio Management	3
Acctg. 213—Income Tax Accounting	3
B. Law 112—Commercial Law	3
Econ. 245—Government and Business	3
Econ. 255—Regional Economics	3
Econ. 257—Urban Economics	3
Mrktg. 114—Personal Selling	3
Geog. 110—Urban Geography	3
Geog. 150—Transportation	3
L. Arc. 5—Introduction to Landscape Architecture	1
Total	12

Security Markets and Investment Option

Students interested in security sales, security analysis, and portfolio administration should select this option. This option prepares students for careers with brokerage houses, investment banking firms, trust departments of commercial banks, pension funds, foundations, endowment funds, mutual funds, and a number of other financial and nonfinancial institutions where security analysis and portfolio management are vital functions.

Security Markets and Investment Program	*Hr.*
Fin. 250—Security Analysis and Portfolio Management	3
Fin. 251—Bank Management	3
Business and Economics Directed Electives (subject to availability) (6 hr. from list below)	6
Fin. 115 or Fin. 161 (whichever is not taken to fulfill finance core)	3
Fin. 212—Working Capital Management	3
Acctg. 111—Intermediate Accounting 1	3
Acctg. 112—Intermediate Accounting 2	3
Acctg. 213—Income Tax Accounting 1	3
Econ. 211—Intermediate Macroeconomic Theory	3
Econ. 241—Public Finance	3
Mrktg. 114—Personal Selling	3
Total	12

Marketing Majors

Marketing offers a wide variety of career opportunities in such fields as promotion management (advertising and sales); sales management; distribution (retail and wholesale management, purchasing, transportation management, and physical distribution); and marketing research.

The marketing curriculum is designed to give the students a broad working knowledge of the theory and practice of marketing as preparation for employment or further study.

Electives provide flexibility in the several phases of marketing adaptable to the students' special career interest in either small and local firms or the multinational corporate giants (see Career Paths below).

Students interested in pursuing careers in any of these areas should enroll in this program.

	Hr.
1. Required Marketing Core (select 4 of the 5 core courses)	12
Mrktg. 113—Marketing Research	
Mrktg. 114—Personal Selling	
Mrktg. 115—Distribution Channels	
Mrktg. 120—Promotion Management	
Mrktg. 130—Product and Price Policies	
2. Required of all Marketing Majors	3
Mrktg. 211—Marketing Management	
3. Marketing Electives	6
4. Business and/or Economics Electives	3
	24

Marketing Career Guidelines

While marketing majors are free to select any combination of marketing elective courses, economic electives, other business electives, and outside courses to meet program and degree requirements, students are urged to

consult with faculty and consider the guidelines and recommendations enumerated below in the several possible career paths in marketing.

The following courses are recommended. However, there is no guarantee that these courses will be offered while the student is in attendance at WVU. The offering of courses is subject to availability and it cannot be guaranteed that recommended courses ever will be offered.

Distribution/Purchasing Career Path

Recommended Marketing Core (12 hours):

Mrktg. 113—Mrktg. Research	Mrktg. 115—Distrib. Channels
Mrktg. 114—Personal Selling	Mrktg. 130—Prod. and Price Pol.

Recommended Marketing Electives (6 hours):

Mrktg. 120—Promot. Manag.	Mrktg. 207—Bus. Logistics Manag.
Mrktg. 160—Retailing Manag.	Mrktg. 210—Industrial Mrktg.

Required of All Marketing Majors (3 hours):

Mrktg. 211—Marketing Manag.

Recommended Business Electives (3 hours):

Manag. 205—Govt. and Bus.	B. Law 112—Commercial Law
Acctg. 116—Managerial Acctg.	Fin. 112—Fin. Manag.

Recommended Economics Electives:

Econ. 245—Govt. and Bus.

Recommended Outside Electives:

C.S. 60—Intro. COBOL	Pol. S. 100—Intro. Pol. Anal.
Engl. 208—Sci./Tech. Writ.	Pol. S. 200—Quant. Pol. Anal.
Phil. 10—Intro. Symb. Logic	Spch. 107—Hum. Comm./Rat. Dec.
Phil. 106—Math. Logic	Stat. 231—Sampling Meth.
Psych. 101—Ldrshp & Hum. Rel.	Soc. & A. 204—Complex Org.
Psych. 151—Intro. Soc. Psych.	Soc. & A. 233—Soc. of Work

Sales Management Career Path

Recommended Marketing Core (12 hours):

Mrktg. 114—Personal Selling	Mrktg. 120—Promot. Manag.
Mrktg. 115—Dist. Channels	Mrktg. 130—Prod. and Price Pol.

Recommended Marketing Electives (6 hours):

Mrktg. 113—Mrktg. Research	Mrktg. 205—Cons. Behavior
Mrktg. 203—Sales Manag.	Mrktg. 210—Industrial Mrktg.

Required of All Marketing Majors (3 hours):

Mrktg. 211—Marketing Manag.

Recommended Business Electives (3 hours):

Acctg. 111—Intermed. Acctg.	Manag. 216—Pers. Manag.
Acctg. 112—Intermed. Acctg.	Manag. 217—Pers. & Comp.
B. Law 112—Comm. Law	Fin. 112—Fin. Manag.
Manag. 205—Ind. & Org.	

Recommended Outside Electives:

Psych. 101—Ldrshp. & Hum. Rel.	Spch. 106—Non-Verb. Comm.
Psych. 151—Soc. Psych.	Spch. 111—Hum. Comm.
Psych. 164—Pers. & Soc. Adj.	Engl. 208—Sci./Tech. Writ.

Marketing Research Career Path

Recommended Marketing Core (12 hours):

Mrktg. 113—Mrktg. Research	Mrktg. 120—Promo. Manag.
Mrktg. 115—Dist. Channels	Mrktg. 130—Prod. & Price Pol.

Recommended Marketing Electives (6 hours):

Mrktg. 114—Pers. Selling	Mrktg. 205—Cons. Beh.
Mrktg. 203—Sales Manag.	Mrktg. 207—Bus. Log. Manag.

Required of All Marketing Majors (3 hours):
Mrktg. 211—Marketing Manag.

Recommended Business Electives (9 hours):

Fin. 112—Fin. Manag.	Manag. 210—Bus. Dec.-Mak.
Manag. 201—Bus. Info. Syst.	Manag. 220—Det. Dec. Analy.
Manag. 205—Ind. & Org.	B. Law 112—Comm. Law

Recommended Economics Elective:
Econ. 225—Appl. Bus. & Econ. Stat.

Recommended Outside Electives:

Stat. 212—Intermed. Meth.	Psych. 151—Intro. Soc. Psych.
Stat. 231—Sampl. Methods	Psych. 225—Cogni. & Percep.
Stat. 251—Data Analysis	Psych. 262—Assess. Beh.
C.S. 60—Intro. COBOL	

Promotion Management Career Path

Recommended Marketing Core (12 hours):

Mrktg. 113—Mrktg. Research	Mrktg. 120—Promo. Management
Mrktg. 114—Pers. Selling	Mrktg. 130—Prod. & Price Pol.

Recommended Marketing Electives (6 hours):

Mrktg. 115—Dist. Channels	Mrktg. 203—Sales Manag.
Mrktg. 160—Retail Manag.	Mrktg. 205—Cons. Behavior

Required of All Marketing Majors (3 hours):
Mrktg. 211—Marketing Manag.

Recommended Business Electives (3 hours):

B. Law 112—Comm. Law	Manag. 205—Ind. & Org.
Acctg. 116—Manag. Acctg.	Manag. 230—Entrepreneurship
Manag. 160—Mgt. Small Bus.	Fin. 112—Financial Manag.

Recommended Outside Electives:

Journ. 111—Intro. Pub. Rel.	Journ. 251—Dir. Mail Adv.
Journ. 113—Princ. Adv.	Psych. 151—Intro. Soc. Psych.
Journ. 114—Retail Adv.	Spch. 80—Intro. Mass Med.
Journ. 203—Adv. Med. Analy.	Spch. 221—Persuasion
Journ 204—Media Manag.	

Bachelor of Science in Economics

Knowledge of economics is essential for the understanding of a wide range of domestic and international issues. In economics courses the use of resources and the processes involved in production, distribution, and consumption of goods and services in the American and other economic systems are systematically studied. Undergraduate study in economics includes analysis of how the economy has developed, how it is organized, and how it functions. It involves analysis of the behavior of components of the economy such as households, businesses, and governments, as well as the pricing, development, and use of resources, and regional and community development.

The Department of Economics offers courses designed to prepare the student for work in government and industry, for additional study in economics at the graduate level, and for professional studies in areas such as law, business administration, and public administration.

Students who are making application for initial admission to the College or reapplying for initial admission to the College must complete 58 or more credit hours, attain a 2.5 or better cumulative grade-point average, and must complete each of the following courses with a C or better: 6 hours of Principles of Economics, 6 hours of Accounting Principles, 3 hours of Statistics, and Mathematics 3 or Mathematics 14.

In addition, students entering the College must successfully complete before entering the College: English 1 and 2, and Mathematics 128.

The foregoing are minimum requirements. All students who meet the specific requirements cannot be guaranteed admission to the college. Limitations on admissions may be necessary because of limits imposed by the size of the faculty, other educational resources, and of classroom space.

Students seeking admission to the college must submit a formal application which will be reviewed by a college official to determine eligibility and acceptability of the applicant. Upon admission to the college, students enrolled in the B.S. degree in Economics program are assigned a faculty adviser.

Students who major in economics must complete 62 credit hours in non-economics and non-business courses. These shall consist of University Core Curriculum courses and elective courses.

Non-Business and Non-Economics	*Hr.*	*Total*
Engl. 1 and 2—Composition and Rhetoric	6	
Core Group A Courses	12	
Core Group B Courses (Other than Economics)	6	
Core Group C Courses		
C.S. 5—Computer Applications for Business	4	
Mathematics	6-8	
(One of two mathematics course sequences is required, either Math. 3 or 14 and 128, or Math. 15 and 16. Effective for students entering any college in August 1983 or later.)		
Other Group C electives	4-6	
Other Electives—Non-Business and Economics	23	
Total Non-Business and Economics	62	62
Unrestricted Electives	6	6

B.S. Degree in Economics		
Required College Core Courses:	*Hr.*	
Acctg. 51 and 52—Principles	6	
Econ. 54 and 55—Principles	6	
Econ. 125—Elementary Business and Economics Statistics	3	
Econ. 211—Intermediate Microeconomic Theory	3	
Econ. 212—Intermediate Macroeconomic Theory	3	
Econ. 226—Introductory Econometrics	3	
	24	24

A minimum of 27 upper-division hours in economics, including required courses, is required of all students majoring in economics.

Elective Courses Required in the College:	*Hr.*	
Economics	15	
Business	9	
Economics or Business	12	36
GRAND TOTAL		128

The program cited is effective for students entering the College of Business and Economics (not just the University) during or after August, 1983, or later.

Pre-Business Program

Students who plan to pursue one of the areas in business administration should complete 12 hours in Group A approved courses; 12 hours of Group B approved courses, including Psych. 1 and Soc. & A. 1; and 13 hours of Group C approved courses, including Math. 3, Math. 128, and C.S. 5.

Freshman Year				Sophomore Year			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Psych. 1	3	Engl. 1	3	Econ. 54	3	Econ. 55	3
Math. 3 or 14	3	Math. 128	3	Acctg. 51	3	Acctg. 52	3
Core A	3	Soc. & A. 1	3	C.S. 5	4	Econ. 125	3
Core A	3	Core A	3	Engl. 2	3	Core A	3
Core B	3	Core B	3	Core C	3	Electives—Outside	5
	15		15		16		17

Prerequisites for Upper-Division, Undergraduate Business Courses

To enroll in any upper-division, undergraduate business course offered by the College, the undergraduate student must have completed the following prerequisite courses: 6 hours of Principles of Economics, 6 hours of Accounting Principles, 3 hours of Statistics, and Mathematics 3 or Mathematics 14. Exceptions to the above policy must be approved by the chairperson of the department offering the course.

Pre-Economics Program

Students who plan to pursue the B.S. degree in Economics must complete 12 hours of Core A courses of their choice; 6 hours of Core B courses of their choice other than in economics; and 12 hours of Core C courses, including a minimum of 6 hours of mathematics from the following sequences: Math. 3 (or 14) and 128; or Math. 15 and 16.

Prior to enrolling in any other business or economics course numbered 100 or above, students who are majoring in economics are expected to have completed or to be enrolled in Econ. 125.

Freshman Year				Sophomore Year			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Math. 3 (or 14), 15, 16, or 128*	3-4	Engl. 1	3	Engl. 2	3	Econ. 55	3
		Math. 3 (or 14), 15, 16, or 128*	3-4	Econ. 54	3	Acctg. 52	3
Core A	3			Acctg. 51	3	Core A	6
Core B	3	Core A	3	Econ. 125	3	Elective—Outside	3
Elective—Outside	3	Core B	3	C.S.	5	Core C	2
		Elective—Outside	3				
	15-16		15-16		17		17

*Economics majors must take one of two sequences: Math. 3 (or 14) and 128; or Math. 15 and 16.

Pre-Business and Pre-Economics Programs

Students must observe the University Core Curriculum requirements in terms of distribution and number of credit hours being mindful that certain core courses are cited specifically. During the first two years of residence in the University, students should complete the major portion or all of the University Core Curriculum.

While the pre-business program and the pre-economics program are similar, differences do exist. However, students do not suffer materially with a program change.

Students who were admitted to an institution of higher learning in the Fall of 1986 or later and are making application for initial admission to the College or reapplying for initial admission to the College must complete 58 or more credit hours, attain a 2.5 or better cumulative grade-point average, and must complete each of the following courses with a C or better: 6 hours of Principles of Economics, 6 hours of Accounting Principles, 3 hours of Statistics, and Mathematics 3 or Mathematics 14.

In addition, students must successfully complete before entering the College: English 1 and 2 and Mathematics 128.

The foregoing are minimum requirements. All students meeting the specific requirements may not be guaranteed admission into the college. Limitations on entry may be necessary depending upon the adequacy and the availability of faculty, other resources, and space.

A formal application must be submitted to the college by students seeking admission and will be reviewed to determine eligibility and acceptability.

B.S. in Business Administration Programs

ACCOUNTING

Junior Year	Hr.	Senior Year	Hr.
Acctg. 111, 112	6	Acctg. 210	3
Acctg. 115	3	Acctg. 211 or 217**	3
Acctg. 200 (Fall Semester)	1	B. Law 200*	3
Acctg. 213	3	Manag. 225	3
B. Law 111	3	Electives—	
Fin. 111	3	Bus. & Econ.	2
Manag. 101, 111	6	Unrestricted	9
Manag. 105	3	Outside	5
Mrktg. 111	3	Engl. 105	3
Econ. 130 or Fin. 151	3		
	34		31

*The Law and the C.P.A.

**May be taken concurrently. While Acctg. 211 or 217 is required, majors interested in professional accounting positions and the C.P.A., C.M.A., and C.I.A. examinations are strongly urged to take both courses.

MANAGEMENT

Administrative Science Option

Junior Year				Senior Year			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Manag. 101	3	Acctg. 116	3	B. Law 112	3	Manag. 225	3
Manag. 105	3	Manag. 111	3	Manag. 201	3	Electives—	
B. Law 111	3	Manag. 205	3	Manag. 206	3	Unrestricted	9
Mrktg. 111	3	Manag. 216	3	Engl. 105	3	Elective—	
Fin. 111	3	Electives—		Elective—		Outside	2
Elective—		Bus. or Econ.	6	Bus. or Econ.	3		
Outside	3						
	18		18		15		14

Decision Science Option

Junior Year				Senior Year			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Manag. 101	3	Manag. 111	3	Manag. 210	3	Manag. 211	3
Manag. 105	3	Manag. 201	3	Engl. 105	3	Manag. 220	3
B. Law 111	3	Manag. 205	3	Electives—		Manag. 225	3
Mrktg. 111	3	Electives—		Bus. or Econ.	9	Electives—	
Fin. 111	3	Outside	5	Elective—		Unrestricted	6
Acctg. 116	3			Unrestricted	3		
	18		14		18		15

FINANCE

Commercial Bank and Financial Institutions Option

Junior Year				Senior Year			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Fin. 111	3	Fin. 112	3	Fin. 212	3	Fin. 252	3
B. Law 111	3	Fin. 150	3	Fin. 250	3	Manag. 225	3
Mrktg. 111	3	Fin. 151	3	Fin. 251	3	Electives—	
Manag. 101	3	Fin. 161	3	Engl. 105	3	Unrestricted*	9
Manag. 105	3	Acctg. 116	3	Electives—			
Manag. 111	3			Outside	5		
	18		15		17		15

*Suggested electives: Fin. 115, 262; Econ. 241; Acctg. 111, 213; Manag. 216 (subject to availability).

Corporate Finance Option

Junior Year				Senior Year			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Fin. 111	3	Fin. 112	3	Fin. 161	3	Fin. 212	3
B. Law 111	3	Fin. 115	3	Acctg. 213	3	Manag. 225	3
Mrktg. 111	3	Fin. 150	3	Electives—		Econ. 225	3
Manag. 101	3	Fin. 151	3	Unrestricted	3	Electives—	
Manag. 105	3	Acctg. 116	3	Electives—		Unrestricted*	6
Manag. 111	3			Outside	5		
				Engl. 105	3		
	18		15		17		15

*Suggested electives: Fin. 216, 251, 262; Econ. 211, 212 (subject to availability).

Insurance and Risk Management Option

Junior Year				Senior Year			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Fin. 111	3	Mrktg. 111	3	Acctg. 116	3	Fin. 220	3
Fin. 115	3	Fin. 112	3	Fin. 161	3	Manag. 225	3
B. Law 111	3	Fin. 120	3	Fin. 216	3	Electives—	
Manag. 101	3	Fin. 150	3	Electives—		Unrestricted*	6
Mrktg. 105	3	Fin. 151	3	Unrestricted*	3	Electives—	
Manag. 111	3			Engl. 105	3	Outside	5
	18		15		15		17

*Suggested electives: Acctg. 111, 112; B. Law 211; Manag. 216; Mrktg. 114, 120, 203 (subject to availability).

Security Markets and Investment Option

Junior Year				Senior Year			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Fin. 111	3	Fin. 112	3	Fin. 161	3	Fin. 250	3
B. Law 111	3	Fin. 115	3	Fin. 251	3	Manag. 225	3
Mrktg. 111	3	Fin. 150	3	Acctg. 213	3	Electives—	
Manag. 101	3	Fin. 151	3	Engl. 105	3	Unrestricted*	9
Manag. 105	3	Acctg. 116	3	Electives—			
Manag. 111	3			Outside	5		
	18		15		17		15

*Suggested electives: Fin. 212; Acctg. 111, 112; Econ. 211, 241; Mrktg. 114 (subject to availability).

MARKETING

Junior Year				Senior Year			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Manag. 105	3	Mrktg. core*	3	Mrktg. core*	3	Mrktg. 211	3
Mrktg. 111	3	Mrktg. core*	3	Elective—		Manag. 225	3
B. Law 111	3	Mrktg. core*	3	Marketing	3	Elective—	
Fin. 111	3	Manag. 101	3	Engl. 105	3	Marketing	3
Manag. 111	3	Elective—		Elective—		Elective—	
Elective—		Unrestricted	3	Unrestriced	3	Bus. or Econ.	3
Outside	3	Elective—		Elective—		Elective—	
		Outside	2	Outside	3	Unrestricted	3
	18		17		15		15

*Marketing Core courses must be selected from the following: Mrktg. 113, 114, 115, 120, 130 (subject to availability).

Courses of Instruction

Accounting (Acctg.)

Prerequisites for Upper-Division, Undergraduate Business Courses

To enroll in any upper-division, undergraduate business course offered by the College, the undergraduate student must have completed the following prerequisite courses: 6 hours of Principles of Economics; 6 hours of Principles of Accounting; 3 hours of Statistics, Math. 3 or Math. 14; and 3 hours of Calculus (Math. 128 or Math. 15). In addition, the student must have successfully completed 6 hours of Composition and Rhetoric. Exceptions to the above policy must be approved by the Chair of the department offering the course.

51. *Principles of Accounting.* 3 hr. PR: Sophomore standing. The accounting cycle from the analysis of business transactions through the preparation of financial statements; basic theory and practice with respect to accounting for assets and equities.

B.S. in Economics Program

The economics program is designed for those who wish to emphasize economics in their education for a business career, undertake graduate work for an advanced degree in this field, or for government service.

Junior Year				Senior Year			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Econ. 211	3	Econ. 212	3	Elective—		Econ. 226	3
Elective—		Elective—		Bus.	3	Electives—	
Bus.	3	Bus.	3	Electives—		Bus. or Econ.	6
Elective—		Electives—		Econ.	6	Electives—	
Econ.	3	Econ.	6	Elective—		Unrestricted	6
Electives—		Elective—		Bus. or Econ.	3		
Outside	9	Outside	3	Elective—			
		Elective—		Outside	2		
		Bus. & Econ.	3				
	18		18		14		15

52. *Principles of Accounting.* 3 hr. PR: Acctg. 51. Utilization of accounting information for purposes of managerial control and decision making; cost concepts, profit and financial budgeting, analysis of financial statements.

111. *Intermediate Accounting.* 3 hr. PR: Grade of A or B in Acctg. 52. Development of accounting theory and practice, with emphasis on asset accounting.

112. *Intermediate Accounting.* 3 hr. PR: Grade of C or better in Acctg. 111. Theory and practice with respect to accounting for liabilities and stockholder's equity; special problems peculiar to financial accounting; analysis of financial statements and changes in financial position.

115. *Cost Accounting.* 3 hr. PR: Acctg. 52; Math. 128. Fundamentals of cost determination with emphasis on the significance of cost data and their interpretation; process, job-order, and standard costs.

116. *Managerial Accounting.* 3 hr. *(No credit available to students having credit for Acctg. 115.)* PR: Acctg. 52. For non-accounting majors. Analysis of internal accounting practices with emphasis on use of data for performance evaluation, control, motivation through accounting systems, and decision-making.

200. *Special Topics.* 1-4 hr. PR: Acctg. 111 or consent. Special topics relevant to accounting. *(Maximum of 9 semester hours in any or all courses numbered 200 offered by the College of Business and Economics may be applied toward bachelor's and master's degrees.)*

210. *Advanced Accounting.* 3 hr. PR: Acctg. 112. Accounting for business combinations, consolidations, foreign currency translation, governmental and not-for-profit entities, and equity method investment accounting.

211. *Accounting Systems.* 3 hr. PR: C.S. 5, Acctg. 115, Acctg. 112 or consent. Analysis of data processing fundamentals and information systems analysis, design, and implementation, including necessary computer hardware and software components with particular reference to accounting information systems and the controls necessary therein.

213. *Income Tax Accounting.* 3 hr. Conc.: Acctg. 111 or 116 or consent. Overview and survey of Federal income tax principles for individuals and simple corporations with emphasis on gross income, exemptions, deductions, capital gains and losses, and tax credits.

214. *Income Tax Accounting.* 3 hr. PR: Acctg. 213 or consent. The study of Federal income tax treatment of partnerships, corporations and estates, and the treatment of those property transfers subject to the Federal Gift Tax, together with an introduction to tax research and tax procedure.

216. *Advanced Managerial Accounting.* 3 hr. PR: Acctg. 111 and 115 or 116. Special problems in cost accounting, including tax planning, inventory control, and decision models on C.P.A./C.M.A. examination. Selected problems and cases will be used. *(Course will not be offered in 1986-87.)*

217. *Auditing Theory.* 3 hr. PR or Conc.: Acctg. 210. Auditing fundamentals; objectives, ethics, statistical samplings, standards and procedures. Emphasis on FASB and SAS disclosures.

218. *Auditing Practice.* 3 hr. PR: Consent. Application of auditing theory and procedures, with emphasis on decisions which invoke judgment and are important in independent audits; audit working papers and reports; case studies. *(Course will not be offered in 1986-87.)*

224. *Advanced Accounting Problems.* 3 hr. PR: Minimum of 18 hr. in accounting with an average grade of B or higher. Analysis and solution of representative C.P.A. problems. *(Course will not be offered in 1986-87.)*

230. *Advanced Accounting Theory.* 3 hr. PR: Acctg. 112, 115, and consent. Critical analysis of accounting concepts and standards with emphasis on their origin, development, and significance. *(Course will not be offered in 1986-87.)*

292. *Accounting Concepts and Techniques.* 2 hr. PR: Consent. (Course primarily for graduate students in Industrial and Labor Relations.) Basic accounting concepts and techniques for decision making. Emphasis on the interpretation and analysis of financial statements and internal accounting reports. *(Course will not be offered in 1986-87.)*

299. *Independent Study.* 1-3 hr. PR: Consent. Students will develop and complete a program of specialized studies under the supervision of a cooperating instructor. This program may not include credit for internships or employment experience.

Business Law (B. Law)

Prerequisites for Upper-Division, Undergraduate Business Courses

To enroll in any upper-division, undergraduate business course offered by the College, the undergraduate student must have completed the following prerequisite courses: 6 hours of Principles of Economics; 6 hours of Principles of Accounting; 3 hours of Statistics, Math. 3 or Math. 14; and 3 hours of Calculus (Math. 128 or Math. 15). In addition, the student must have successfully completed 6 hours of Composition and Rhetoric. Exceptions to the above policy must be approved by the Chair of the department offering the course.

111. *Legal/Ethical Environment of Business.* 3 hr. The nature of law and the judicial system. The relationship of law, ethics, and cultural values to the business enterprise. Substantive law of contracts, sales, and credit transactions and the social and economic consequences of court decisions.

112. *Commercial Law.* 3 hr. PR: B. Law 111. Substantive law of agency, partnerships, corporations, negotiable instruments, and property and their social and economic functions.

200. *Special Topics.* 1-4 hr. PR: B. Law 112 or consent. Special topics relevant to business law. *(Maximum of 9 semester hours in any or all courses numbered 200 offered by the College of Business and Economics may be applied toward bachelor's and master's degrees.)*

211. *Personnel Relations and the Law.* 3 hr. The legal principles guiding employer-employee relations, including agency law and the law regulating employee health, safety, compensation and benefits, job opportunity, and labor organizing.

Economics (Econ.)

51. *The Economic System.* 3 hr. PR: Sophomore standing. The pricing system, monetary system, determination of national income, and employment. A one-semester principles course for non-majors.

54. *Principles of Economics.* 3 hr. PR: Sophomore standing. Elementary microeconomic analysis.

55. *Principles of Economics.* 3 hr. PR: Econ. 54 and sophomore standing. Elementary macroeconomic analysis.

110. *Comparative Economic Systems.* 3 hr. PR: Econ. 54 and 55. Structure and processes of existing economic systems throughout the world including review of basic principles of free enterprise, socialistic, communistic, and fascistic societies. Comprehensive analysis based on current and recent experiments in these economies.

125. *Elementary Business and Economic Statistics.* 3 hr. PR: Grade of C or better in either Math. 3 or 14 or consent. Basic concepts of statistical models, distributions, probability, random variables, tests of hypotheses, confidence intervals, regression and correlation with emphasis on business and economic examples. *(Equiv. to Stat. 101.)*

130. *Money and Banking.* 3 hr. PR: Econ. 54 and 55. Our system of monetary and banking arrangements, viewed in relation to functioning of the economic system as a whole.

160. *Labor Economics.* 3 hr. PR: Econ. 54 and 55. Survey of labor in the United States economy. Introduction of theories of employment and wage determination. Topics include labor history and law, the changing work roles of women, minority opportunities, and the problem of unemployment.

200. *Special Topics.* 1-4 hr. PR: Econ. 54 and 55 or consent. Special topics relevant to economics. *(Maximum of 9 semester hours in any or all courses numbered 200 offered by the College of Business and Economics may be applied toward bachelor's and master's degrees.)*

211. *Intermediate Microeconomic Theory.* 3 hr. PR: Econ. 54. Consumer choice and demand; economics of time; price and output determination and resource allocation in the firm and market under a variety of competitive conditions; welfare economics, externalities, public goods, and market failure.

212. *Intermediate Macroeconomic Theory.* 3 hr. PR: Econ. 54 and 55. Forces which determine the level of income, employment, and output. Particular attention to consumer behavior, investment determination, and government fiscal policy.

213. *Economic Development.* 3 hr. PR: Econ. 54 and 55. The problems, changes, and principal policy issues faced by nonindustrialized countries.

216. *History of Economic Thought.* 3 hr. PR: Econ. 54 and 55. Economic ideas in perspective of historical development.

220. *Introduction to Mathematical Economics.* 3 hr. PR: Math. 15 or 128, and Econ. 54 and 55; or consent. Principal mathematical techniques including set operation, matrix algebra, differential and integral calculus employed in economic analysis. Particular attention given to static (or equilibrium) analysis, comparative-static analysis and optimization problems in economics.

225. *Applied Business and Economic Statistics.* 3 hr. PR: Econ. 125 or Stat. 101 or consent. Continuation of Econ. 125. Principal statistical methods used in applied business and economic research including multiple regression, index numbers, time series analysis, forecasting models and methods, and sampling design.

226. *Introductory Econometrics.* 3 hr. PR: Econ. 54 and 55 and Econ. 125 or Stat. 101. Statistical methods applied to the analysis of economic models and data. Emphasis placed on multiple regression, multicollinearity, seasonality, heteroscedasticity, autocorrelation, dummy variables, time series analysis, distributed lags and simultaneous equations with economic and computer applications.

241. *Public Finance.* 3 hr. PR: Econ. 54 and 55. Governmental fiscal organizations and policy; taxes and tax systems with particular emphasis on the federal government and the state of West Virginia.

245. *Government and Business.* 3 hr. PR: Econ. 54 and 55. Market structure, conduct, and performance: analysis of the antitrust laws—judicial interpretation and effect on the business sector.

250. *International Economics.* 3 hr. PR: Econ. 54 and 55. Development of trade among nations; theories of trade, physical factors, trends, and barriers in international economics.

255. *Regional Economics.* 3 hr. PR: Econ. 54 and 55. Analysis of the regional economy's spatial dimension, emphasizing interregional capital and labor mobility, the role of cities, objectives and issues of regional policy, lagging regions and Appalachia, growth poles, and regional growth and income distribution.

257. *Urban Economics.* 3 hr. PR: Econ. 54 and 55. Analyzes the spatial dimensions of urban economy, emphasizing both urban economic theory and urban policy. Issues include cities and income inequality, urban upgrading function, blight, economics of ghettos, the economies of urban size.

270. *Growth of the American Economy.* 3 hr. PR: Econ. 54 and 55. Central issues in the development of the American economy.

297. *Internship.* 1-12 hr. PR: Econ. 54 and 55 and departmental approval. Field experience in the analysis and solution of economic problems in the public and private sectors.

299. *Readings in Economics.* 1-3 hr. PR: Econ. 54 and 55. Students will develop and carry out a program of specialized readings under the supervision of a cooperating instructor.

Finance (Fin.)

Prerequisites for Upper-Division, Undergraduate Business Courses

To enroll in any upper-division, undergraduate business course offered by the College, the undergraduate student must have completed the following prerequisite courses: 6 hours of Principles of Economics; 6 hours of Principles of Accounting; 3 hours of Statistics, Math. 3 or Math. 14; and 3 hours of Calculus (Math. 128 or Math. 15). In addition, the student must have successfully completed 6 hours of Composition and Rhetoric. Exceptions to the above policy must be approved by the Chair of the department offering the course.

111. *Business Finance.* 3 hr. PR: Acctg. 51 and 52. Activities of the finance manager in the planning, acquisition, and administration of funds used in a business enterprise.

112. *Financial Management.* 3 hr. PR: Fin. 111; (Math. 128 and a grade of B or better in Fin. 111.) Application of fundamentals and theory of the analysis of cases in business finance.

115. *General Insurance.* 3 hr. Theory of risk and its application to insurance; principles underlying insurance—life, property, casualty, fire, and surety.

120. *Life Insurance.* 3 hr. PR: Fin. 115. Principles of life and health insurance protection. Application of life insurance to individual, family, business, and societal needs.

150. *Investments.* 3 hr. PR: Fin. 111 or consent. Investment analysis and management for the individual and the financial institution.

151. *Financial Institutions.* I, II. 3 hr. PR: Fin. 111 and Econ. 55. The role of financial institutions in our nation's financial markets and the economy. Analysis of interest rate, financial markets and federal revenue policy.

161. *Real Estate.* 3 hr. Principles and practices of real estate business. *(Course may not be offered in 1986-87.)*

200. *Special Topics.* 1-4 hr. PR: Fin. 111, or Fin. 311, or consent. Special topics relevant to finance. *(Maximum of 9 semester hours in any or all courses numbered 200 offered by the College of Business and Economics may be applied toward bachelor's and master's degrees.)*

212. *Working Capital Management.* I, II. 3 hr. PR: Fin. 111, or Fin. 311, Econ. 125. Management of current assets and liabilities. Topics include the management of cash, marketable securities, accounts receivable, inventories, trade accounts payable, and short-term bank borrowings. Decision models are used extensively.

216. *Risk Management.* 3 hr. PR: Fin. 115 or consent. Transferable risks with which the entrepreneur must deal. Emphasis on the process by which decisions are made for handling these risks, including an examination of contributions and limitations of insurance system.

220. *Social Insurance.* 3 hr. PR: Fin. 115 or consent. Our social and political efforts to provide economic security for the general public. An examination of the parallel developments of private insurance.

250. *Security Analysis and Portfolio Management.* 3 hr. PR: Fin. 150 or consent. The systematic selection, assessment, and ranking of corporate securities in a portfolio framework through a synthesis of fundamental analysis, technical analysis, and random walk.

251 / 331. *Bank Management.* PR: Fin. 111 or consent. *(May not be taken for both undergraduate and graduate credit.)* Management of bank funds. Principles of organization lending and investment. Policy relationships to bank productivity, organization, and profitability; preparation of financial reports; management of a simulated bank in a changing environment.

252. *Advanced Bank Management.* 3 hr. PR: Fin. 251 or consent. An advanced course in commercial banking involving problems of management of the money position, loan and investment portfolio and capital adequacy. The student simulates actual bank operation, conducts case studies, and analyzes bank performance.

261. *Real Estate Appraising.* 3 hr. PR: Fin. 161. The appraisal problem. Plan the approach, acquire, classify, analyze and interpret data into an estimate of value by the use of the cost or replacement approach, income approach, and market approach. *(Course may not be offered in 1986-87.)*

262. *Real Estate Finance.* 3 hr. PR: Fin. 111, or Fin. 311, 161 or consent. How financing, the tax system, and supply and demand interact to create values which, when coupled with investment decision, leads to choosing an investment strategy in real estate. *(Course may not be offered in 1986-87.)*

263. *Real Estate Investments/Land Development.* 3 hr. PR: Fin. 161 or consent. Designed to investigate various types of real estate investments including apartments, office buildings, shopping centers, and residential land developments with emphasis on financial analysis, profitability analysis, and rates of return. *(Course may not be offered in 1986-87.)*

299. *Independent Study.* 1-3 hr. PR: Consent. Students will develop and complete a program of specialized studies under the supervision of a cooperating instructor.

Industrial and Labor Relations (ILR)

262. *Collective Bargaining and Labor Relations.* 3 hr. PR: Econ. 160 or consent. Examination of the theory and practice of collective bargaining. Topics include economic and historical environment, labor law, unionization, contract negotiation, patterns in contract content, conflict resolution, grievance handling, and an introduction to arbitration.

Management (Manag.)

Prerequisites for Upper-Division, Undergraduate Business Courses

To enroll in any upper-division, undergraduate business course offered by the College, the undergraduate student must have completed the following prerequisite courses: 6 hours of Principles of Economics; 6 hours of Principles of Accounting; 3 hours of Statistics, Math. 3 or Math. 14; and 3 hours of Calculus (Math. 128 or Math. 15). In addition, the student must have successfully completed 6 hours of Composition and Rhetoric. Exceptions to the above policy must be approved by the Chair of the department offering the course.

101. *Introduction to Business Information Systems.* 3 hr. PR: C.S. 5 or equiv. Overview of business information systems. Introduces hardware, software, procedures, systems and human resources. Explores their integration and application in business information systems.

105. *Contemporary Management.* 3 hr. Management as a process involving the functions of planning, organizing, controlling, and directing. Provides an integrated view of the management discipline with emphasis on organizational behavior issues.

111. *Production and Quantitative Business Methods.* 3 hr. PR: Manag. 101, 105; Econ. 125. The process of industrial production. Includes analysis of the efficient use of the facilities of production. Integrates appropriate quantitative decision-making tools.

160. *Management of Small Business.* 3 hr. PR: Manag. 105. Focusing on the management of small business, the course is designed both for those seeking employment in small business, and for those entering large organizations which deal with small firms as suppliers, customers, and competitors. *(Course will not be offered in 1986-87.)*

200. *Special Topics.* 1-4 hr. PR: Manag. 105 or consent. Special topics relevant to management. *(Maximum of 9 semester hours in any or all courses numbered 200 offered by the College of Business and Economics may be applied toward bachelor's and master's degrees.)*

201. *Business Information Systems.* 3 hr. PR: Manag. 101 and 105, Fin. 111, Mrktg. 111, Acctg. 52, C.S. 5. Use of EDP for decision making with emphasis on application in the functions of finance, marketing, personnel, accounting, and operations management. 3 hr. lec., 3 hr. lab.

205. *The Individual and the Organization.* 3 hr. Examination of how the individual, the group, and the organization interact to influence the behavior of the business organization and that of its human resources.

206. *Organizational Theory and Analysis.* 3 hr. PR: Manag. 205 or consent. Influences of structure on the behavior and dynamics of the business organization. Attention on how to be an effective manager.

210. *Business Decision-Making Under Uncertainty.* 3 hr. PR: Manag. 111; C.S. 5. Analysis of business problems where certainty does not exist. The case approach with actual or realistic data involving more than one business functional area. Solution of unique business problems.

211. *Advanced Production Management.* 3 hr. PR: Manag. 111. Integration of quantitative techniques and their application to production problems. Utilizes cases and projects.

213. *Problems in Business Administration.* 1-3 hr. Selected management problems related to the total enterprise and the emerging technostructure, e.g., managerial and corporate strategy, utilization of resources, social responsibility and government relations, dynamics of new industries.

216. *Personnel Management.* 3 hr. Leading and motivating people whose work behavior is influenced by technology, organization, and management style as those affect the individual and work groups.

217. *Personnel and Compensation.* 3 hr. PR: Manag. 216. Designing and implementing total compensation systems in both private and public sectors. The emerging elements of total compensation systems are included providing insights into problems and opportunities for personnel.

218. *Focal Points in Management.* 1-3 hr. PR: Manag. 105. In-depth study of specialized management subjects, e.g., personnel interviewing, job descriptions, consulting, or organizational development. *(Each subject is self-contained, spans one-third of a semester, and is valued at 1 credit hour.) (Course will not be offered in 1986-87.)*

220. *Deterministic Decision Analysis.* 3 hr. PR: Manag. 111. Study and application of quantitative methods to business problems in which deterministic conditions prevail.

225. *Business Policy.* 3 hr. PR: Senior standing and consent. Integration of key components of the business curriculum. The case method is utilized to study a wide variety of policy issues including international and ethical concerns.

230. *Enterpreneurship.* 3 hr. PR: Manag. 160. The role of the entrepreneur in business and society; includes an analysis of the individual entrepreneur, and investigates the nature and problems of establishing a new business enterprise. *(Course will not be offered in 1986-87.)*

260. *Practicum in Small Business.* 3 hr. PR: Manag. 160. A practical training ground in the identification and solution of small business problems. Through interaction with the business community, students are exposed to the opportunities and difficulties of small business entrepreneurship. *(Course will not be offered in 1986-87.)*

299. *Independent Study.* 1-3 hr. PR: Consent. Students will develop and complete a program of specialized studies under the supervision of a cooperating instructor.

Marketing (Mrktg.)

Prerequisites for Upper-Division, Undergraduate Business Courses

To enroll in any upper-division, undergraduate business course offered by the College, the undergraduate student must have completed the following prerequisite courses: 6 hours of Principles of Economics; 6 hours of Principles of Accounting; 3 hours of Statistics, Math. 3 or Math. 14; and 3 hours of Calculus [Math. 128 or Math. 15]. In addition, the student must have successfully completed 6 hours of Composition and Rhetoric. Exceptions to the above policy must be approved by the Chair of the department offering the course.

111. *Introduction to Marketing.* 3 hr. PR: Econ. 54, 55. Specific functional areas studied include sales management; consumer behavior; market research; product management; promotion management; distribution management; and price policies.

113. *Marketing Research.* 3 hr. PR: Mrktg. 111. Scientific approach to the solution of marketing problems with emphasis on research methods and techniques.

114. *Personal Selling.* 3 hr. PR: Mrktg. 111. Deals with interpersonal communication, influencing, and persuasion processes designed to satisfy customer and company needs; stresses the structure of sound sales presentations through lectures, persuasive presentations, and appraisal and correction of common selling errors.

115. *Distribution Channels.* 3 hr. PR: Mrktg. 111. Management of channel systems with emphasis on retail distribution, channel choice, strategies, control, and optimization within the context of role, power, conflict, and communications.

120. *Promotion Management.* 3 hr. PR: Mrktg. 111. An analysis of the promotional mix options; advertising; personal selling; and sales promotion, and the integration of these options into the marketing mix.

130. *Product and Price Policies.* 3 hr. PR: Mrktg. 111. Deals with the company's product offering as economic and marketing variables influencing product's price; stress on determination of product and price objectives, planning, implementation, and evaluation of results.

160. *Retail Management.* 3 hr. PR: Mrktg. 111. The organization and operating environment of retail firms. Special emphasis placed on consumer market segmentation and the marketing variables of merchandise mix, effective pricing, store location, and communication with suppliers and consumers.

200. *Special Topics.* 1-4 hr. PR: Mrktg. 111 or consent. Special topics relevant to marketing. *(Maximum of 9 semester hours in any or all courses numbered 200 offered by the College may be applied toward bachelor's and master's degrees.)*

201. *Focal Points in Marketing.* 1-3 hr. PR: Mrktg. 111. In-depth study of specialized marketing subjects, e.g., franchising, tourism, packaging, or product development. *(Each subject is self-contained, spans one-third of a semester, and is valued at 1 credit hour.)*

203. *Sales Management.* 3 hr. PR: Mrktg. 114. Concentrates on the managerial responsibilities of sales managers for directing, motivating, and controlling a sales force plus the techniques of selling including handling objections and closing.

205. *Consumer Behavior.* 3 hr. PR: Mrktg. 111. The consumer decision process in a marketing framework. Emphasis on psychological and sociological concepts which influence the decision process.

207. *Business Logistics Management.* 3 hr. PR: Mrktg. 115 or consent. Examination of transportation, warehousing, materials handling, containerization, inventory control, purchasing, and warehouse location. Significant use made of problem solving with analytical tools.

210. *Industrial Marketing.* 3 hr. PR: Mrktg. 111. A study of marketing to three classes of customers: the industrial market, the institutional market, and government agencies.

211. *Marketing Management.* 3 hr. PR: Mrktg. 111; 12 hr. of marketing or consent. Simulation, through live and written case study, should sharpen skills as the student makes analytical evaluations of marketing problems.

299. *Independent Study.* 1-3 hr. PR: Consent. Students will develop and complete a program of specialized studies under the supervision of a cooperating instructor.

College of Creative Arts

Creative development in art, music, and theatre is the purpose of the College of Creative Arts of West Virginia University. A distinguished faculty of musicians, actors, directors, and artists brings to the center's outstanding facilities a commitment to a creative process of artistic growth which is shared with each student. Here, in a rich environment of plays, art exhibits, and concerts, the student is offered the knowledge, skills, and inspiration necessary for professional success.

The Division of Art offers a faculty of practicing artists and scholars prepared to train dedicated students for careers as professional artists or teachers of art. While practicing your art in the College of Creative Arts studios you may work toward a degree concentrating in any of the following specialities: Art Education, Ceramics, Graphic Design, Painting, Printmaking, and Sculpture.

The Division of Music offers the opportunity to perform, study, and compose music of all styles under the guidance of an expert faculty of artist performers, teachers, and scholars. Performing groups include the Marching Band, Concert Band, Wind Ensemble, University Choirs, Opera Theatre, Symphony Orchestra, Percussion Ensemble, Jazz Ensembles, Collegium Musicum, and many others.

Degrees are offered with concentration in: Music Education, Performance, Music History, Composition, and Music Theory.

Advanced standing in the Division of Music in Applied Music and Music Theory is given only after examination.

The Division of Theatre offers concentrated training programs in four different areas of the theatre arts and crafts. An outstanding faculty works closely with the undergraduate major both in the classroom and in three campus theatres, as well as on tour with the WVU Puppet Mobile.

Degrees are offered with concentration in any one of the following areas: Acting, Design, Musical Theatre, and General Theatre.

College of Creative Arts Performance Grants are available each year in the Divisions of Art, Music, and Theatre. The Division of Music maintains additional scholarship funds for support of deserving students.

Auditions for scholarships in music and theatre are scheduled throughout the school year. For information or an appointment, write the Chairperson, Division of Music or Theatre, College of Creative Arts, West Virginia University, P.O. Box 6111, Morgantown, WV 26506-6111, or telephone (304) 293-4841.

Students transferring to the College of Creative Arts from other colleges and universities are required to present a minimum grade-point average of 2.0. Exceptions may be made in the case of first-semester freshman students.

The College of Creative Arts reserves the right not to offer courses in the listed semester on the basis of low enrollment, change in curriculum, availability of faculty, or other reasons at the convenience of the College of Creative Arts.

Complete information concerning WVU admissions, fees, and expenses is in Part 2 of the *WVU Undergraduate Catalog*. Academic information is in Part 3.

Application for Graduation and Diploma

All candidates for degrees in the College of Creative Arts must fill out an application for graduation and diploma at the College of Creative Arts' Undergraduate Records Office. Candidates should make such application during the second semester of their junior years in order to have their records evaluated as to College of Creative Arts and University requirements. Application must be made during the first month of the semester or summer session in which the candidate expects to be graduated. If a student does not, for some reason, graduate on the date for which the student applied initially, the student must re-apply for a later date. No candidate can be graduated without application.

Faculty

Philip F. Faini, M.M. (WVU), *Interim Dean of College of Creative Arts; Professor of Music. Percussion. African Music.*
Margaret S. Lorince, M.M. (Eastman Sch. of Mus.), *Interim Assistant Dean, Professor of Music. Piano. Pedagogy.*
Richard E. Duncan, Ph.D. (Eastman Sch. of Mus.), *Dean and Professor Emeritus.*

Division of Art

Professors

John D. Clarkson, M.A. (U. Pitt)—*Emeritus.*
Urban Couch, M.F.A. (Cranbrook Acad. Art). Painting, Curator.
Barbara A. Drainer, Ed.D. (Columbia U.)—*Emerita.*
Ben F. Freedman, M.A. (U. Ariz.). Painting, Drawing.
Clifford A. Harvey, B.F.A. (Mpls. C. Art & Des.). Graphic design.
Thomas E. Morin, M.F.A. (Cranbrook Acad. Art)—*Chair.* Sculpture.
Margaret T. Rajam, Ph.D. (U. Mich.). Art history, Italian renaissance.

Associate Professors

Robert P. Anderson, M.F.A. (Alfred U.). Ceramics.
John B. Schultz, Ph.D. (U. Pitt). Art history, Late Italian renaissance.
Eve F. Small, M.F.A. (R.I. Sc. Design). Graphic design.
William J. Thomas, Ph.D. (Penn St. U.). Art education.

Assistant Professors

Carmon Colangelo, M.F.A. (LSU). Printmaking.
Virginia T. Derryberry, M.F.A. (U. Tenn.). Painting.
Victoria Fergus, M.A. (Peabody C.). Art education.
Alison Helm, M.F.A. (Syracuse U.). Sculpture.
Robert L. Qualters, M.F.A. (Syracuse U.)—*Visiting.* Painting.
Virginia Scotchie, M.F.A. (Alfred U.). Ceramics, Sculpture.

Lecturer

L. Victor Haines. Photography.

Division of Music

Professors

John Beall, Ph.D. (Eastman Sch. of Mus.). Composition, Theory.
James W. Benner, M.A. (Columbia U.)—*Emeritus.*
Clifford W. Brown, M.F.A. (Carnegie-Mellon U.)—*Emeritus.*
Thomas S. Canning, M.M. (Eastman Sch. of Mus.)—*Emeritus.*
Jon Crain. Voice.
Clyde M. English, D.S.M. (Union Theol. Sem.)—*Emeritus.*
Philip J. Faini, M.M. (WVU)—*Interim Dean.* Percussion, African music.
Herman Godes, M.M. (Latvian St. Mus. Acad.)—*Coordinator, Keyboard Instruments.* Piano.
Joseph A. Golz, M.A. (Columbia U.)—*Emeritus.*
William P. Haller, D.M.A. (N. Tex. St. U.). F.A.G.O. Organ, Theory.
Leo Horacek, Jr., Ph.D. (U. Kans.)—*Emeritus.*
Barton Hudson, Ph.D. (Ind. U.)—*Director, Graduate Studies.* Musicology, Renaissance music, Harpsichord.
Gerald Lefkoff, Ph.D. (Cath. U. Am.). Theory, Electronic music, Viola.
Frank E. Lorince, Ph.D. (Eastman Sch. of Mus.)—*Coordinator, Theory-Composition.* Theory.
Margaret S. Lorince, M.M. (Eastman Sch. of Mus.)—*Interim Assistant Dean; Coordinator, Music Preparatory Programs.* Piano, Piano pedagogy.
James E. Miltenberger, D.M.A. (Eastman Sch. of Mus.). Piano, Piano repertoire, Jazz.
Donald C. Portnoy, D.M.A. (Peabody Conserv. Mus.)—*Director, Orchestral Activities; Coordinator, Strings.* Violin; Conducting.

Richard E. Powell, M.Ed. (S.W. Tex. St. C.)—*Coordinator, Brass-Percussion Instruments.* Low brass instruments, Pedagogy.
George E. Schafer, Ph.D. (Eastman Sch. of Mus.)—*Emeritus.*
William Skidmore, M.M. (U. Ill.). Cello, Chamber music.
Gilbert Trythall, D.M.A. (Cornell U.). Composition, Electronic music, Theory.
Don G. Wilcox, M.A. (Cal. St. C., L. Bch.)—*Director of Bands.* Conducting.
Cecil B. Wilson, Ph.D. (Case West. Res. U.)—*Chair.* Musicology, Nineteenth-century music, Orchestration.
Frances Yeend—*Emerita.*

Associate Professors

Dawn S. Baker, Ph.D. (U. Md.). Music education, General music.
Thomas S. Brown, Ph.D. (Northwestern U.). Music education, Vocal music, Appalachian music.
Joyce Catalfano, M.M. (Ithaca C.)—*Coordinator, Woodwind Instruments.* Flute.
Rose M. Crain—*Emerita.*
Reginald W. Goeke, Ed.D. (U. Ill.). Music education, Instrumental music.
Bernard R. McGregor, M.F.A. (Carnegie-Mellon U.)—*Emeritus.*
June D. Swartwout, M.M. (WVU)—*Emerita.*
William Taylor, M.M. (Ind. U.)—*Coordinator, Voice-Opera.* Voice.
Christopher Wilkinson, Ph.D. (Rutgers U.)—*Coordinator, Music History-Literature.* Musicology, Baroque music, Twentieth-century music.

Assistant Professors

Rex Conner, M.M. (U. Cincinnati). Violin, String pedagogy.
Lawrence A. Edwards, M.S. (U. Ill.)—*Director of Choral Activities.* Conducting.
David Hastings, M.M. (Northwestern U.). Saxophone, Jazz ensemble.
Jere T. Humphreys, Ph.D. (U. Mich.)—*Coordinator, Music Education.* Music education, Instrumental music.
John C., Hunt, M.M. (Cath. U. Am.). Bassoon, Theory.
Christine B. Kefferstan, D.M.A. (U. Cincinnati). Piano, Group piano.
Mayola Martin, M.M. (Juilliard). Piano.
Janis-Rozena Peri, M.M. (Miami U.). Voice, Vocal diction.
Jane R. Pestun, M.M. (WVU)—*Emerita.*
Robert H. Thieme, Jr., M.M. (WVU)—*Director, WVU Opera Theatre.* Opera, Vocal repertoire, Accompanying-coaching.
John F. Weigand, M.M. (Northwestern U.)—*Coordinator, Undergraduate Admissions.* Clarinet, Chamber music.
Eve Anne Wilkes, D.M.A. (WVU). Voice.
John R. Winkler, M.M. (Northwestern U.). Trumpet, Theory, Chamber music.

Instructors

Patricia Barry, M.M. (Northwestern U.)—*Visiting.* Oboe, Theory.
Barbara Coeyman, M.A. (U. Penn)—*Visiting.* Musicology, Baroque music, Collegium Musicum.
Mary Hickson Hunt, B.M. (Eastman Sch. of Mus.)—*Visiting.* Horn, Theory.

Lecturers

Oswald DePaul—*Part-Time.* Violin.
Jeffrey T. Mangone, B.S.M.E. (Duquesne U.)—*Part-Time.* Double bass.
David P. McCollum, M.M. (Duquesne U.)—*Part-Time.* Tuba.
David Satterfield, M.M. (WVU)—*Assistant Director of Bands.* Percussion.
Albert J. Wrublesky, M.M. (WVU)—*Part-Time.* Percussion.
Frances Yeend—*Part-Time.* Voice.

Division of Theatre

Professors

Angela D'Ambrosia, B.F.A. (Carnegie-Mellon U.). Acting.
Joe E. Ford, M.A. (WVU)—*Emeritus.*

Frank Gagliano, M.F.A. (Columbia U.)—*Claude Worthington Benedum Professor.* Playwriting.
Charles D. Neel, Ph.D. (Cornell U.). Musical theatre.
John C. Whitty, Ph.D. (U. Iowa)—*Acting Chair.* Theatre history.

Associate Professors
Mary Kathryn Gonder Brindle, Ph.D. (U. Pitt). Voice and speech.
J. Kristine Haugan, B.A. (U. Minn.). Theatre design.
Joann Spencer Siegrist, M.F.A. (U. Ga.). Puppetry, Creative drama.

Assistant Professors
W. James Brown, M.F.A. (U. Wash.). Theatre design.
Brackley Frayer, M.F.A. (Yale U.). Theatre technology.
Edward T. Herendeen, M.F.A. (Ohio U.). Acting.
Linda D. Milian, M.F.A. (Rutgers U.). Costuming.
Deborah Tulchin, M.F.A. (NYU). Theatre design.

Lecturers
Maria Barney, M.F.A. (U. Pitt). Voice and speech.
Leonard D. Grissom, M.F.A. (Brandeis U.). Theatre history, Directing.
Dennis B. Richards, M.A. (U. N.C.). Stage movement.

Division of Art

The curriculum of the Division of Art is designed to afford the student an opportunity to explore the various fields of the visual arts. Undergraduate programs offer a full range of scholarly and studio experiences to potential artists and teachers. The in-depth instruction is enhanced by the close working relationship between students and faculty which allows sharing of the insights and investigative processes of a staff of professional artists and scholars.

The Bachelor of Fine Arts (B.F.A.) or Bachelor of Arts (B.A.) degree is conferred upon those students who satisfy all University and department requirements, complete the appropriate curriculum, and comply with the general regulations of the University concerning degrees.

A candidate for a degree in the Division of Art must maintain a minimum grade-point average of 2.0 (C). In addition, students may be requested to present a portfolio of selected works for examination and evaluation by a faculty committee. The committee shall be empowered to make recommendations regarding the student's continuing work toward a degree in art.

Transfer applicants must establish transfer credit from other institutions during the first semester in which they are enrolled in the Division of Art. Evaluation for advanced standing or transfer credit in studio subjects will not be made solely upon the presentation of a transcript but will also depend on the evaluation of a portfolio of art work. The Division of Art requires a portfolio examination for placement in the program.

The Division of Art is an accredited institutional member of the National Association of Schools of Art and Design.

Bachelor of Fine Arts Curriculum (B.F.A.)

The Bachelor of Fine Arts (B.F.A.) is a professional degree awarded to those persons who have satisfactorily completed the required 128 semester credit hours of study and made the expected commitment to the vocation of art. This degree program requires an amount of self-education based on a sound foundation of studio experience. Students in the B.F.A. curriculum may participate in a wide range of studio class work, including drawing, design, painting, printmaking, ceramics, graphic design, and sculpture, as well as a

program of art history. Through careful counseling, individual goals are established in keeping with the student's aims and talents.

The Division of Art is commited to providing the opportunity and the environment for the best possible education in the visual arts at both the undergraduate and graduate levels. The division's program of professional education is centered in the studio arts and reinforced with art historical and liberal arts studies. Students are encouraged to take advantage of the broad range of educational possibilities available at the University and to enroll in courses which will support their professional goals and enrich their understanding.

Curriculum Requirements

Once accepted into the University and the art program, the B.F.A. student must complete curriculum requirements in order to graduate. The B.F.A. curriculum includes required and elective art courses, art history courses, and University-established academic (general education) requirements. During the first two years the art student must complete a sequence of courses in drawing and foundation visual design for a total of 20 credit hours. Art electives which are available in all major studio areas are designed to provide the basic experience that will enable the student to select a major by the beginning of the third (junior) year. The student must complete 12 credit hours of these studio electives and 6 credit hours of art history survey to complete the lower-division requirements of the art program (a total of 38 hours within the Division of Art).

B.F.A. Degree credit-hour minimum requirements are as follows:

Hr.	
72	Studio (12 credits must be in drawing and 30 credits in major area)
2	Art Orientation
12	Art History
33	Liberal Arts (academics required by the University)
9	Elective (art history, studio or liberal arts)
128	Hours Total

B.F.A. Program

In order to complete the B.F.A. degree program in four years, a student must take from 15 to 18 credit hours per semester, or 30 to 36 credits per year.

A typical B.F.A. degree program which completes degree requirements in four years is as follows:

Freshman Year

Hr.	
6	Drawing
6	Visual Foundations (2- and 3-dimensional design)
6	Art History
14	Liberal Arts (including English)
2	Art Orientation
34	Hours Total

Sophomore Year

Hr.	
6	Drawing
12	Studio (elected from three of the five major studio areas)
12	Liberal Arts
30	Hours Total

Junior Year
Hr.
21 Studio (including 9 hours in major area)
6 Art History
4 Liberal Arts
3 Elective

34 Hours Total

Senior Year
Hr.
21 Studio (including 15 semester credit hours in major area)
3 Liberal Arts
6 Elective

30 Hours Total

To enter the upper division, major area studio courses, the student must have completed the four-semester lower-division program which should include at least two semesters (6 semester credit hours) to introductory work from the area of intended major.

Lower Division: The two-year, lower-division required sequence of courses in drawing, visual foundations, art orientation, art history, and introductory studio prepares the student for advanced study. Idea development, technical ability, and communication skills are taught with equal emphasis by involving the student in a wide range of problems.

The first year of lower-division instruction offers a broad experience in drawing, design, and art history. Emphasis is on basic skills and the development of a common vocabulary with which student objectives can be clearly defined. In the second year, students have the option of selecting introductory courses from three of the five major studio areas which are most suited to their particular interests. Advanced drawing is also required in the second year.

Lower-division art requirements are as follows:
Art 11—Drawing, 3 hr.
Art 12—Drawing, 3 hr.
Art 100—Art Orientation, 2 hr.
Art 121—Visual Foundation, 3 hr.
Art 122—Visual Foundation, 3 hr.
Art 105—Survey of Art, 3 hr.
Art 106—Survey of Art, 3 hr.
Art 211—Drawing, 3 hr.
Art 212—Drawing, 3 hr.
Studio Introductory—12 hr.
Lower-Division Art Total: 38 Hours

Upper Division: The third-year of study marks the entry into the upper division. The student begins to concentrate in one area of major studio concern, and to direct and apply the basic skills acquired during the first two years of art instruction. Major areas offered by the Division of Art are ceramics, painting, printmaking, graphic design, and sculpture.

During the third and fourth years, the studio major accounts for a minimum of 24 semester credit hours or almost half the credit earned. The remaining credit hours are taken in art history, studio electives, electives, and liberal arts.

Upper-division art requirements are as follows:
Art 200—Studio Major, 24 hr. (minimum)
Art 100/200--Studio electives, 18 hr.

Art 200—Art History, 6 hr.
Upper-Division Art Total: 48 Hours

B.F.A. Liberal Arts Requirements: Liberal arts requirements are defined by WVU. The undergraduate art student must successfully complete a minimum of 33 semester credit hours of liberal arts to qualify for graduation. To satisfy this requirement the following distribution of liberal arts credits must be achieved:

English 1 and 2—6 hr.
Core A (Humanities)—3 hr.
Core B (Social Sciences)—12 hr.
Core C (Natural Sciences)—12 hr.
Liberal Arts Total: 33 Hours

B.F.A. with Certification Curriculum Requirements: Students wishing to be certified to teach K-12 in West Virginia must complete competency requirements established by the state in addition to Division of Art B.F.A. degree requirements.

B.F.A. degree with certification credit-hour minimum requirements are as follows:

69 Studio (12 credits must be in drawing and 30 credits in major studio area)
2 Art Orientation
12 Art History
41 Liberal Arts
37 Art Education and Education (including student teaching)

161 Hours Total

B.F.A. with Certification Curriculum: This variation of the regular B.F.A. program begins after the completion of the freshman year and requires careful selection of both studio and academic courses. But to the additional liberal arts and education course requirement, 4½-5 years of school work should be anticipated.

B.F.A. with Certification Curriculum Liberal Arts and Education Requirements: Liberal arts requirements are designed by the state of West Virginia certifying agency and WVU. Education requirements are maintained by the state. Undergraduate art students desiring certification should consult with the Art Education adviser to be certain of compliance with certification criteria.

Bachelor of Art (B.A.) Art Education Curriculum

To qualify for teaching art in the public schools, elementary through secondary level, the student should complete the Art Education single comprehensive curriculum, Grades K-12. The program features a commitment to practical experience integrated with a strong studio involvement.

Curriculum Requirements

The B.A. student must complete the stated curricular requirements in order to graduate. The B.A. curriculum includes required and elective studio art courses, required art history courses, and University established academic (liberal arts) requirements, as well as those courses prescribed by the state to qualify for certification.

The first year of instruction is the same for all art majors—B.F.A. or B.A. Students must complete a sequence of courses in drawing, visual foundation design, and art survey. The second year of the B.A. program includes a

number of studio art courses required as competencies required by the state, as well as necessary academic and education courses.

B.A. degree credit-hour minimum requirements are as follows:

45 Studio
2 Art Orientation
6 Art History
41 Liberal Arts
37 Art Education and Education (including student teaching)

131 Hours Total

B.A. Program

To complete the B.A. degree program in four years, a student must take from 15 to 18 credit hours per semester, or 30 to 36 credits per year.

A typical B.A. degree program which completes degree requirements in four years is as follows:

Freshman Year
6 Drawing
6 Visual Foundation (2- and 3-dimensional design)
6 Art History
14 Liberal Arts (including English)
2 Art Orientation

34 Hours Total

Sophomore Year
21 Studio (including electives)
12 Liberal Arts
2 Education (C&I)

35 Hours Total

Junior Year
3 Drawing
3 Studio
6 Art Education
12 Liberal Arts
6 Education

30 Hours Total

Senior Year
6 Studio
3 Art Education
3 Liberal Arts
20 Education (including student teaching)

32 Hours Total

For the complete qualification requirements and certification information, students should contact the Art Education adviser in the Division of Art.

Other Programs

For information concerning undergraduate interdepartmental programs in Art History, Special Education (with an art emphasis), and Medieval and Renaissance Studies please contact the Division of Art office in the College of Creative Arts.

Advising

It is recommended that all art majors confer regularly with their adviser in order to maintain the correct distribution of course work and establish the

necessary prerequisites for upper-division instruction. In general students will find it difficult to carry more than three studio art classes in one year.

Portfolio Review

The Division of Art reserves the privilege of requiring a portfolio review to determine a student's retention in a program or emphasis.

Audit, Credit by Examination, Pass/Fail, and Non-Art Major Courses

No studio courses are available on an audit or credit by examination basis. Students enrolled in the Division of Art may not take art classes on a Pass/Fail basis. Courses designated for non-art majors may not be substituted for art degree requirements unless approved in advance by the Chairperson of the Division of Art.

Student Work

Every effort is made to protect student work and property. Work displayed in the WVU Art Galleries is insured for the exhibition period. The Division of Art does not accept responsibility for damage or losses under other circumstances.

The Division of Art reserves the right to retain certain examples of student work for reproduction and exhibition purposes.

Art Supplies

Supplies for classroom presentations, demonstrations and common use must—for economy and availability—be purchased from a central source and fund.

To expect every student individually to supply all materials needed for high consumption courses of instruction would create a situation of excessive financial hardship for most and a complex logistical problem for all. To offset this burden, the Division of Art orders in advance necessary supplies through the WVU Book Store at a bulk rate, and requires each student enrolled in those studio classes in which materials are supplied to share the cost through one payment per semester.

The cost varies according to the area of instruction and may range from as little as $10.00 per semester for a freshman student to as much as $90-120 per semester for a senior in some major areas. Instructors can provide a complete list of materials to be supplied.

Courses of Instruction in Art (Art)

3. *Materials and Procedures.* I, II, S. 3 hr. For elementary education majors. Designed to familiarize the student with two- and three-dimensional media, processes, and concepts.

11. *Drawing.* I, II. 3 hr. Fundamental principles of drawing.

12. *Drawing.* I, II. 3 hr. *(Complementary to Art 11.)* Fundamental principles of drawing.

30. *Appreciation of Visual Arts.* I, II, S. 3 hr. The study of outstanding works of the visual arts from times past to the present: (1) sources of the creative impulse, and (2) relationship of art to the civilization producing it.

100. *Directed Art Studies.* I, II, S. 1-3 hr. *(May be repeated for credit.)* PR: Consent. Studies in painting, sculpture, printmaking, graphic design, ceramics, drawing, art education, art history; includes independent study.

105. *Survey of Art.* I. 3 hr. History of visual art from prehistoric times to the Renaissance.

106. *Survey of Art.* II. 3 hr. History of visual art from the Renaissance to the present.

113. *Painting.* I, II. 3 hr. PR: Art 12, 121 or equiv. Basic concepts and techniques in watercolor and/or acrylic painting.

114. *Painting.* I, II. 3 hr. PR: Art 12, 121 or equiv. Basic concepts and techniques in oil painting.

121. *Visual Foundation.* I, II. 3 hr. Visual perception, composition, manipulation of materials, and exploration of two-dimensional formal elements.

122. *Visual Foundation.* I, II. 3 hr. *(Continuation of Art 121.)* Three-dimensional formal elements.

123. *Graphic Design.* I, II. 3 hr. PR: Art 12, 121 or equiv. An introduction to the tools, materials, and basic principles of graphic design with emphasis on form and color.

124. *Graphic Design.* I, II. 3 hr. PR: Art 123 or equiv. *(Complementary to Art 123, with particular emphasis on typographic solutions.)* An introduction.

126. *Sculpture.* I, II. 3 hr. PR: Art 12, 122 or equiv. An introduction to basic sculptural concepts using simple materials and techniques.

127. *Sculpture.* I, II. 3 hr. PR: Art 126 or equiv. Extension of Art 126, using more complex materials and printmaking.

130. *Printmaking.* I, II. 3 hr. PR: Art 12, 121 or equiv. Basic concepts and techniques of intaglio printmaking.

131. *Printmaking.* I, II. 3 hr. PR: Art 12, 121 or equiv. Basic concepts and techniques of lithographic printmaking.

140. *Ceramics.* I, II. 3 hr. PR: Art 12, 122 or equiv. Basic concepts, techniques, and media in ceramics.

141. *Ceramics.* I, II. 3 hr. PR: Art 12, 122 or equiv. *(Complementary to Art 140).* Fundamental concepts, techniques, and media.

165. *Art Education in the Elementary School.* I. 3 hr. PR: Art 12, 122 or equiv. The content and character of art education at the elementary level, emphasizing methods and techniques of instruction.

166. *Art Education in the Secondary School.* II. 3 hr. PR: Art 12, 122 or equiv. The content and character of art education at the secondary level, emphasizing methods and techniques of instruction.

200. *Directed Art Studies.* I, II, S. 1-15 hr. *(May be repeated for credit.)* PR: Consent. Studies in painting, sculpture, printmaking, graphic design, ceramics, drawing, art education, art history; includes independent study.

211. *Figure Drawing.* I, II, S. 3 hr. PR: Art 12, 121 or equiv. A course in compositional structure from the figure.

212. *Advanced Drawing.* I, II, S. 3 hr. *(May be repeated for credit.)* PR: Art 211 or equiv. Advanced tutorial drawing course.

Division of Music

The Division of Music is an accredited institutional member of the National Association of Schools of Music, the only nationally recognized accrediting agency for professional music instruction. All programs comply with objectives and guidelines as required by this organization. The music education program is fully accredited by the National Council for Accreditation of Teacher Education and the West Virginia Department of Education.

The student interested in a career in music has a wide range of occupations from which to choose. Most fall into one of three basic categories: performing, composing or arranging, and teaching. To these ends, the Division of Music offers specialized programs in Performance (Applied Music), Theory-Composition, Music History-Theory, and Music Education, all of which lead to the degree of Bachelor of Music. Each of these curricula prepares the student for the added career option of private studio teaching in the principal performance area. Piano majors in performance may choose an alternative emphasis in pedagogy, accompanying, or jazz. An emphasis in jazz for students in the Applied Curriculum-Band or Orchestra Instrument is presently under study. Please consult a music adviser if you have an interest in this emphasis.

Students who complete a curriculum in Music Education will have satisfied course requirements to teach both vocal and instrumental music, as well as general music, in the elementary and secondary schools, grades K-12. With further study on the graduate level, students may qualify for teaching positions in a junior or community college, four-year college, or university. Others may aspire to a career in performance as a solo artist or as a member of an ensemble, or may compose or arrange music for performance.

Music graduates sometimes pursue interests in such areas as music librarianship, arts management, arts journalism/criticism, or in the music publishing and manufacturing industries, in consulting, editorial, sales, or management positions.

All applicants to music programs must audition before they can be considered for admission. Students should own their own instruments under normal circumstances (except for piano).

A music major can change from one music curriculum to another, particularly during the freshman or sophomore years, without great loss of course credit. Music majors are encouraged to explore and follow the curriculum for which they are best qualified and in which they can expect the greatest success. Evaluation of their work by the Division of Music faculty will aid these decisions.

Some students who wish a broader, liberal arts-oriented program may pursue the Bachelor of Arts (B.A.) degree. The B.A., with a major in Music, offered jointly with the College of Arts and Sciences, is described on page 257. In addition to the undergraduate program, courses leading to the following graduate degrees are offered: Master of Music, Doctor of Philosophy, and Doctor of Musical Arts.

The 43-member faculty provides a rich background in professional performance and musical scholarship, along with a sincere interest in students. Students find these dedicated teachers to be both demanding and sympathetic.

Faculty performing groups include the Mountain State Brass Quintet, Laureate Wind Quintet, Baroque Ensemble, American Arts Trio, and the Amart String Quartet. The West Virginia Symphonette, a professional chamber orchestra, includes many faculty among its membership. Student performing groups, in addition to those listed below, include the Opera Theatre, Percussion Ensemble, Trombone Ensemble, and numerous small chamber ensembles.

Musical Organizations

After completing four semesters in one of the bands or the orchestra, especially qualified members of these organizations may continue service in

them upon invitation and receive allowances in the form of remission of fees amounting to $30.00 per semester.

The *University-Community Symphony Orchestra* is open, by audition, to all students and residents of the community who are proficient in the playing of an orchestra instrument. The repertoire is that of the standard orchestra, with special emphasis on contemporary American music. (May be taken for credit.)

The *Glee Clubs* are select groups which specialize in the traditional and special repertoire for voices in the soprano-alto or tenor-bass range. (May be taken for credit.)

The *University Choir* is an ensemble of forty vocalists selected by audition. The group sings the standard choral repertoire and makes off-campus appearances during the year. (May be taken for credit.)

The *Collegium Musicum* is devoted to the performance of music for small vocal or instrumental ensembles, primarily early music. (May be taken for credit.)

The *University Choral Union* is open to all University students who can satisfactorily sing a part, by audition. This organization offers opportunity to participate in the performance of major choral works. (May be taken for credit.)

The *Wind Ensemble* is a select group of approximately forty wind and percussion players chosen by audition and performs music particularly appropriate to its size and special characteristics. (May be taken for credit.)

The *Symphonic Band* and *Concert Band* are open to all qualified WVU students by audition. They perform both traditional and contemporary band music. (May be taken for credit.)

The *Mountaineer Marching Band* of over 300 members is open to all qualified students in the University. Its activities are confined to the first semester, during which time it presents music and marching pageantry at football games and other special occasions. (May be taken for credit.)

The *Varsity Band* is open to all qualified WVU students. Activities are confined to the Spring semester; it performs at home basketball games and other special events, and functions as a concert band after the basketball season. (May be taken for credit.)

The *Jazz Ensembles* are stage bands which perform many original compositions, as well as those from the big band era and from the repertory of contemporary jazz bands. Membership is by audition. (May be taken for credit.)

Bachelor of Music Degree

Acceptance. After admission to the University but before being accepted as a music major, each student must demonstrate satisfactory previous musical preparation through an entrance audition. These conference-auditions are held in Morgantown throughout the school year, and in Charleston and other cities by special arrangement. A tape recording and other supporting material may be submitted when circumstances prevent a visit to Morgantown for this purpose. Dates of these auditions and details concerning them are available from the Division of Music.

The audition is a preliminary assessment of student potential for success in the program. The assessment will be confirmed or revised after the first semester of study.

In addition to fulfilling the special requirements indicated below for the appropriate curriculum, each student also must satisfy the following general requirements.

Proficiency Levels. Before graduation, each undergraduate student must satisfy a specified Proficiency Level appropriate to the curriculum in the student's principal performance area, in piano (if piano is not the major instrument), and in voice (in the case of instrumental music education majors). A listing of the Proficiency Levels for each area is available from the Division of Music. The listed repertoire (or works of comparable technical and musical difficulty) for each level is to be performed with musical understanding as well as technical mastery in order to satisfy the requirement. Students who are admitted conditionally must make up deficiencies as soon as possible. Lack of reasonable progress will subject the student to probation. If, in the judgment of the faculty, it will be impossible for the student to complete graduation requirements in a reasonable length of time, the student's enrollment in the Division of Music will be terminated.

Keyboard Proficiency Examination. In addition to fulfilling the Proficiency Level requirement in piano indicated in the curriculum, each student is required to demonstrate proficiency in keyboard harmony by passing a special examination.

Recital and Concert Attendance. Each full-time undergraduate music major who enters as a freshman is expected to attend eight recital or concert programs in which he or she is not a participant for six semesters in which he or she is in residence. This requirement is adjusted for transfer students.

Participation in Musical Organizations. Each music major must participate in musical organizations for the number of semesters indicated in the curriculum. Scholarship recipients may be called upon to render special service (as participants in particular organizations or ensembles, as piano accompanists, etc.), as designated by the division chairperson. All students should purchase and bring to campus a portable (folding) music stand.

Completion of Degree Requirements. The student is responsible for correctly fulfilling all graduation requirements. Each student should review the curriculum requirements both before and after every registration period so that errors or omissions will be detected immediately. *Transfer students* must establish transfer credit from other institutions as early as possible in their WVU study—preferably during the first semester of residence. The degree of Bachelor of Music is conferred upon any student who complies with the general regulations of the University concerning degrees, satisfies departmental requirements, including expected Proficiency Levels, and completes an appropriate curriculum with a minimum overall grade-point average of 2.0 (C).

The sample curricular outlines which follow may vary as to actual distribution in individual semesters. The precise number of elective credits in a given semester, for example, may vary with the student's choice of courses. In curricula in which the course number Music 110 is listed twice, the student is expected to study both principal and secondary instruments.

Applied Music

The Applied Music curricula are especially designed for students wishing to prepare themselves as performers or as teachers of a particular instrument or voice. The increased interest of society today in the arts is creating many new opportunities for the professional musician and for the private music teacher.

A student in an Applied Music curriculum should enter as a freshman having achieved Grade Level 6 in the principal performance area, and must

complete Grade Level 10 in that area to be eligible for graduation. In addition to presentation of a senior recital, Applied Music majors also must make three solo appearances on the major instrument in upper-level student recitals.

Applied Music majors are encouraged to participate in the division's major performing organizations (Music 100-105). A maximum of 8 hours of credit in these organizations will be counted toward the 8-semester requirement for graduation.

Theory electives may include Music 160, 171, 172, 260, 263, 264, 265, 267, 268.

APPLIED CURRICULUM—PIANO

At least 2 of the 8 semesters of required participation in musical organizations (Music 100-105) must be as a member of a choral group (Music 102 or 105). With the permission of the Coordinator of Keyboard Studies, up to 3 semesters of this requirement may be satisfied by enrollment in Music 115 (Chamber Music-Accompanying). A total of 19 hours of courses from Core groups B and C is required, with no less than 6 hours to be earned in either group. A recommended distribution of the courses required in this curriculum:

FIRST YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110	4	Music 110	4
Music 61, 62	4	Music 63, 64	4
Music 100-105	1-2	Music 31	1
Engl. 1	3	Music 100-105	1-2
G.P.E. 1	1	G.P.E. 2	1
Core B or C	3	Core A	3
		Core B or C	3
	16-17		17-18

SECOND YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110	4	Music 110	4
Music 65, 66	4	Music 67, 68	4
Music 33	3	Music 34	3
Music 100-105	1-2	Music 100-105	1-2
Music 115	1	Music 115	1
Music elective	2	Music elective	2
Engl. 2	3	Elective	3
	18-19		18-19

THIRD YEAR

First Sem	*Hr.*	*Second Sem.*	*Hr.*
Music 110	4	Music 110	4
Music 100-105	1-2	Music 221-225	3
Music 115	1	Music 100-105	1-2
Music 118	2	Music 115	1
Theory elective	2	Music 119	2
Theory elective	3	Theory elective	2
Music elective	2	Music elective	2
Elective	3	Core B or C	3
	18-19		18-19

FOURTH YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110	4	Music 110	4
Music 115	1	Music 115	1
Music 218	2	Music 219	2
Music 100-105	1-2	Music 299	2
Music elective	2	Music 100-105	1-2
Core B or C	6	Music elective	2
		Core B or C	4
	16-17		16-17

Minimum: 137 hr.

Applied Curriculum—Piano Pedagogy Emphasis

Admission only by approval of the piano faculty. Required for graduation: Proficiency Level 9; Senior recital; and 3 performances on Upper Level Recitals.

Candidates for the Applied Degree in Piano with Pedagogy Emphasis will follow the basic Applied Piano curriculum with the following changes:

1. In Second Year—Substitute 4 hours of Music 118-119 for the 4 hours of music elective.

2. In Third Year—Substitute 3 hours of Music 210 or 212 for the 2 hours of Music 118 and 2 hours of music elective during the first semester, and 3

hours of Music 151 for the 2 hours of Music 119 and 2 hours of music elective during the second semester. Requires 17-18 hours each semester.

3. In Fourth Year—Substitute 3 hours of Music 210 or 212 for 2 hours of music elective during the first semester and 2 hours of Major Project—Music 200—for the 2 hours of music elective during the second semester. Requires 17-18 hours the first semester and 16-17 hours in the second semester.

Applied Curriculum—Piano Jazz Emphasis

Admission only by approval of the piano faculty. (Limited to those students with experience and a demonstrated ability in the area of jazz improvisation.) Required for graduation: Proficiency Level 9; Senior recital (no more than one-half of program consisting of jazz); and 3 Upper Level Recital performances.

Candidates for the Applied Degree in Piano with Jazz Emphasis will follow the basic Applied Piano curriculum with the following change: Only 2 semesters of Music 100-105 required with the remaining 6 semesters of participation in musical organizations to be earned in non-piano sections of Music 115 which require a jazz pianist (Jazz Ensemble, Trombone Ensemble, Percussion Ensemble, etc.).

Applied Curriculum—Piano Coaching-Accompanying Emphasis

Admission only by approval of the piano faculty. Required for graduation: Proficiency Level 10; Senior Recital; coach and accompany under supervision: 2 full voice recitals, 1 string recital, 1 recital of another instrument (Clarinet, Flute, Oboe, Horn); coach, prepare musically and accompany in performance two scenes from standard-repertory operas in their original languages (scenes should involve a minimum of two people and be scenes with some dramatic development). No solo performances on Upper Level Recitals are required.

Candidates for the Applied Degree in Piano with Coaching-Accompanying emphasis will follow the basic Applied Piano curriculum with the following changes:

1. In Second Year—Substitute Music 218-219—Voice Repertoire, 4 hours, Music 113, 2 hours, and Music 19, 2 hours (1 hour each semester), for 7 hours elective. Requires 19-20 hours of first semester and 18-19 hours the second.

2. In Third Year—Substitute Music 113, 4 hours for the music elective; and add Music 19, 2 hours (1 hour each semester). Requires 19-20 hours each semester.

3. In Fourth Year—Substitute Music 113 for 2 hours of music elective and add Music 19; 2 hours (1 hour each semester). Requires 17-18 hours each semester.

APPLIED CURRICULUM—ORGAN

In addition to the required Proficiency Level 10 in organ, this curriculum also requires achievement of Proficiency Level 5 in piano before graduation. At least 6 of the 8 semesters of required participation in musical organizations (Music 100-105) must be as a member of a choral group (Music 102-105). A total of 19 credit hours earned from Core groups B and C is required, with no less than 6 credit hours earned in either group. A recommended distribution of the courses required in this curriculum:

FIRST YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110-10	4	Music 110-10	4
Music 110-09	2	Music 110-09	2
Music 61, 62	4	Music 63, 64	4
Music 100-105	1-2	Music 31	1
Engl. 1	3	Music 100-105	1-2
G.P.E. 1	1	G.P.E. 2	1
Core B or C	3	Core B or C	4
	18-19		17-18

SECOND YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110-10	4	Music 110-10	4
Music 110-09	2	Music 110-09	2
Music 65, 66	4	Music 67, 68	4
Music 33	3	Music 34	3
Music 100-105	1-2	Music 100-105	1-2
Engl. 2	3	Elective	3
	17-18		17-18

THIRD YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110-10	4	Music 110	4
Music 51	1	Music 221-225	3
Theory elective	2	Theory elective	2
Music 118	1	Theory elective	3
Music 100-105	1-2	Music 119	1
Music elective	3	Music 100-105	1-2
Core B or C	6	Music elective	3
	18-19		17-18

FOURTH YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110-10	4	Music 110-10	4
Music 100-105	1	Music 100-105	1-2
Music 218	1	Music 219	1
Core B or C	3	Music 299	2
Music elective	3	Music elective	4
Core A	3	Core B or C	3
Elective	3		
	18-19		15-16

Minimum: 137 hr.

APPLIED CURRICULUM—VOICE

In addition to the required Proficiency Level 10 in voice, a student completing this currciulum must also achieve Proficiency Level 3 in piano before graduation. One year of either Italian, French, or German is required, as is one course from each Core group (A, B, and C). A recommended distribution of the courses required in this curriculum:

FIRST YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110	4	Music 110-18	4
Class Piano	1	Class Piano	1
Music 61, 62	4	Music 31	1
Music 113	2	Music 63, 64	4
Music 102 or 105	1-2	Music 113	2
Engl. 1	3	Music 102 or 105	1-2
G.P.E. 1	1	Core B or C	3
		G.P.E. 2	1
	16-17		17-18

SECOND YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110-18	4	Music 110-18	4
Class Piano	1	Class Piano	1
Music 65, 66	4	Music 67, 68	4
Music 33	3	Music 34	3
Music 113	2	Music 113	2
Music 102 or 105	1-2	Music 102 or 105	1-2
Engl. 2	3		
	18-19		15-16

THIRD YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110	4	Music 110	4
Class Piano	2	Class Piano	2
Music 19	2	Music 19	2
Theory elective	2	Music 102 or 105	1-2
Music 102 or 105	1-2	Theory elective	2
Foreign Lang.	3	Foreign Lang.	3
Core B or C	3	Theory elective	3
	17-18		17-18

FOURTH YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110	4	Music 110	4
Music 118	1	Music 119	1
Music 19	2	Music 19	2
Music 218	2	Music 219	2
Music 221-225	3	Music 299	2
Music 102 or 105	1-2	Music 102 or 105	1-2
Music elective	3	Music elective	2
		Core A	3
	16-17		17-18

Minimum: 133 hr.

APPLIED CURRICULUM—BAND OR ORCHESTRA INSTRUMENT
Flute, Oboe, Clarinet, Saxophone, Bassoon, Horn, Trumpet, Trombone, Euphonium, Tuba, Percussion, Violin, Viola, 'Cello, and Double Bass

In addition to the required Proficiency Level 10 on the major instrument, this curriculum also requires achievement of Proficiency Level 3 in piano before graduation. A total of 19 credit hours of courses from Core groups B and C is required, with no less than 6 credit hours earned in either group. A recommended distribution of the courses required in this curriculum:

FIRST YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110	4	Music 110	4
Class Piano	1	Class Piano	1
Music 61, 62	4	Music 63, 64	4
Music 100 or 103	1-2	Music 100 or 103	1-2
Engl. 1	3	Core B or C	3
G.P.E. 1	1	G.P.E. 2	1
Core B or C	3	Music 31	1
	17-18		15-16

SECOND YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110	4	Music 110	4
Class Piano	1	Class Piano	1
Music 65, 66	4	Music 67, 68	4
Music 33	3	Music 34	3
Music 100 or 103	1-2	Music 100 or 103	1-2
Engl. 2	3	Elective	3
	16-17		16-17

THIRD YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110	4	Music 110	4
Class Piano	2	Class Piano	2
Music 171	2	Music 172	2
Music 118	1	Music 119	1
Music 115	1	Music 115	1
Music 100 or 103	1-2	Music 100 or 103	1-2
Theory elective	2	Theory elective	2
Core B or C	3	Core A	3
Elective	3		
	19-20		16-17

FOURTH YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110	4	Music 110	4
Music 221-225	3	Music 299	2
Music 115	1	Music 115	1
Music 100 or 103	1-2	Music 100 or 103	1-2
Music elective	4	Theory elective	3
Core B or C	6	Core B or C	4
	19-20		15-16

Minimum: 133 hr.

APPLIED CURRICULUM—WOODWINDS

Applied music majors whose major instrument is in the woodwind family and who show strong performance ability on another woodwind instrument may qualify for the Applied Curriculum in Woodwinds. Approval for admission to this curriculum will not be given by the woodwind faculty until after the first year of study at which time the student must achieve an appropriate level on three of the five woodwind instruments. In addition to the senior recital (which may be given on more than one instrument), the student in this curriculum must present three solo upper-level student recital performances, one on each of the three major instruments. Proficiency Level requirements for this curriculum are:

A primary major woodwind instrument: Proficiency Level 9.

Two secondary major woodwind instruments: Proficiency Level 7.

Two minor woodwind instruments: Proficiency Level 4.

Piano: Proficiency Level 2.

The recommended distribution of the required courses is the same as in the *Applied Curriculum—Band or Orchestra Instrument*, with the following changes:

1. Substitution of 2 hours in Music 110 and 2 hours in Music 115 for the 3 hours of electives during the second year.

2. Substitution of 4 hours in Music 110 for the 3 hours of electives in the third year.

3. Substitution of 4 hours in Music 110 for the 4 hours of music electives in the fourth year. Total minimum credits for the curriculum: 135.

Theory-Composition, Music History-Theory

The Theory-Composition Curriculum concentrates on developing skills in musical analysis, composition, and arranging. Students pursuing the Music History-Theory Curriculum find more emphasis on history and less on musical composition.

Students in these curricula will satisfy the 8 semester requirement for participation in a performing organization through registration in Music 100-105, 115, or 239 (Band, Orchestra, Choral Union, University Choir, Chamber Music, or Collegium Musicum), with at least 4 hours being earned in a major performing group (Music 100-105). Majors in these curricula must present two solo performances on the major instrument in Upper Level Recitals before graduation.

THEORY-COMPOSITION CURRICULUM

An average of at least B in the required freshman and sophomore theory courses (Music 61-68) or the consent of the Coordinator of Theory-Composition is required for continuation in this curriculum. A theory-composition major should enter as a freshman having achieved Proficiency Level 4 on the student's major instrument, and must complete Proficiency Level 8 on that instrument before graduation. If piano is not the major instrument, Proficiency Level 4 in this instrument also must be established. A total of 16 hours of courses from Core groups B and C is required, with no less than 6 hours earned in either group. Another language may be substituted for the indicated French, German, or Italian with the approval of the Coordinator of Theory-Composition. The Major Project (Music 266) must be in theory or composition. A recommended distribution of the required courses in this curriculum:

FIRST YEAR				SECOND YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem*	*Hr.*
Music 110	4	Music 110	4	Music 110	2	Music 110	2
Music 61, 62	4	Music 63, 64	4	Music 65, 66	4	Music electives	2
Music 100-105,		Music 31	1	Music 33	3	Music 67, 68	4
or 115	1-2	Music 100-105,		Music 160	2	Music 34	3
Engl. 1	3	or 115	1-2	Music 100-105,		Music 160	2
G.P.E. 1	1	Core B or C	6	or 115	1-2	Music 100-105,	
Core B or C	3	G.P.E. 2	1	French, German,		or 115	1-2
				or Italian 1	3	French, German,	
				Engl. 2	3	or Italian 2	3
	16-17		17-18		18-19		17-18

THIRD YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110	2	Music 110	2
Music 51	1	Music 52	2
Music 171	2	Music 172	2
Music 263	2	Music 264	2
Music 260	2	Music 260	2
Music 267	2	Music 268	2
Music 100-105, 115, or 239	1-2	Music 100-105, 115, or 239	1-2
French, German, or Italian 3	3	French, German, or Italian 4	3
	15-16		16-17

FOURTH YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110	2	Music 110	2
Music electives	6	Music 265	3
Music 260	2	Music 266	2
Music 225	3	Music 221-224	3
Music 100-105, 115, or 239	1-2	Music 100-105, 115, or 239	1-2
Core B or C	3	Core B or C	4
		Music electives	2
	17-18		17-18

Minimum: 133 hr.

MUSIC HISTORY-THEORY CURRICULUM

A maximum of 16 hours of applied music credit (Music 110) will be counted toward the required Proficiency Level 7 on the major instrument. If the student's major instrument is not Piano, up to 12 of the elective credit hours may be used to achieve the required Proficiency Level 4 in that instrument. A student wishing to take more than 6 of the elective credit hours in non-music courses or to substitute a foreign language other than French, German, or Latin may do so only with the consent of the Coordinator of Music History and Literature. The Major Project (Music 266) must be in music history or theory. A recommended distribution of the courses required in this curriculum:

FIRST YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110	4	Music 110	4
Elective	1	Elective	1
Music 61, 62	4	Music 63, 64	4
Music 100-105, or 115	1-2	Music 100-105, or 115	1-2
Engl. 1	3	G.P.E. 2	1
G.P.E. 1	1	Core B	6
Core B	3	Music 31	1
	17-18		18-19

SECOND YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110	2	Music 110	2
Elective	1	Elective	1
Music 65, 66	4	Music 67, 68	4
Music 33	3	Music 34	3
Music 100-105, or 115	1-2	Music 100-105, or 115	1-2
French, German, or Latin 1	3	French, German, or Latin 2	3
Engl. 2	3	Core B	3
	17-18		17-18

THIRD YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110	2	Music 110	2
Elective	2	Elective	2
Music 171	2	Music 172	2
Music 263	2	Music 264	2
Music 221-224	3	Music 221-224	3
Music 100-105, 115, or 239	1-2	Music 100-105, 115, or 239	1-2
French, German, or Latin 3	3	French, German, or Latin 4	3
Core C	4	Music 265	3
	19-20		18-19

FOURTH YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Elective	2	Elective	2
Music 160	2	Music 160	2
Music 225	3	Music 266	2
Music 100-105, 115, or 239	1-2	Music 100-105 115, or 239	1-2
Lit. (English or Foreign)	3	Literature or Art Appreciation	3
Core C	4	Core C	4
	15-16		14-15

Minimum: 135 hr.

Music Education

The Division of Music, The College of Human Resources and Education, and the West Virginia Department of Education are in the process of reviewing, and possibly revising, all certification programs in music education. Students are warned that programs printed in the Catalog may not be in effect at the time of their registration and are advised to see their adviser upon arrival on campus.

Students successfully completing a Music Education curriculum and all other requirements of the West Virginia Department of Education will be qualified for the Professional Certificate, Grades K-12, and will be eligible for certification to teach instrumental, vocal, and general music in the public schools of West Virginia.

In order to qualify for student teaching, a student must have a 2.25 grade-point average in all work attempted, a 2.0 average in Education courses (C&I 7; Ed. P. 103, 105) and a 2.0 average in music education methods courses (M. 151, 152). Students may be called upon to do their student teaching during either semester of the fourth year, and it may be necessary for student teaching to be done outside Monongalia County. Students should plan to provide their own transportation during the student teaching semester.

A student following either Music Education curriculum should enter as a freshman having achieved Proficiency Level 3 on the student's major instrument, and must complete Proficiency Level 7 on that instrument to be eligible for graduation. This requirement may necessitate more credits than identified in the outline below. The student also must present two solo performances on the major instrument in upper-level recitals before graduation.

The Core requirements must contain the following:

(a) 9 hours in Core A, including Art 30 or Theatre 30; 3 hours of literature (in English or in another language); and 3 hours in one of the following: religious studies, philosophy, humanities, English composition, linguistics, or foreign language.

(b) 12 hours in Core B, including at least one course in history, and one course in one of the following: sociology, social science, anthropology, or multidisciplinary areas.

(c) 12 hours in Core C, including at least one course in science (Phys. 7—Physics of Music—is recommended) and one 3-credit course in mathematics.

MUSIC EDUCATION CURRICULUM—VOCAL OR GENERAL MUSIC EMPHASIS

Students wishing to emphasize preparation in choral music or in general music should choose this curriculum. Those whose major performance area is not voice must complete Proficiency Level 3 in voice; those whose major instrument is not piano must complete Proficiency Level 3 in piano. A recommended distribution of the required courses in this curriculum:

FIRST YEAR				SECOND YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Music 110	4	Music 110	4	Music 110	2	Music 110	2
Class Piano	1	Class Piano	1	Class Piano	1	Class Piano	1
Music 61, 62	4	Music 63, 64	4	Music 33	3	Music 34	3
Music 102, 105	1-2	Music 102, 105	1-2	Music 65, 66	4	Music 67, 68	4
Engl. 1	3	Music 31	1	Music 51	1	Music 52	2
G.P.E. 1	1	Core	6	Music 102, 105	1-2	Music 102, 105	1-2
Core	3	G.P.E. 2	1	Engl. 2	3	Core	3
						Music 49	2
	17-18		18-19		15-16		18-19

THIRD YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110	2	Music 53	3
Music 151	3	Music 152	3
C&I 7	2	Ed. P. 105	3
Ed. P. 103	3	Core	6
Core	6		
	16		15

FOURTH YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 248	2	C&I 104	4
Music 48	3	C&I 187	6
Core	3	C&I 188	6
Hl. Ed. 102	2		
Core	6		
	16		16

Minimum: 131 hr.

MUSIC EDUCATION CURRICULUM—INSTRUMENTAL EMPHASIS

Students wishing to emphasize preparation in instrumental music (band or orchestra) should choose this curriculum. The 16 hours of applied music (Music 110) in this curriculum are to be used to achieve the following Proficiency Levels: major instrument, Level 7; voice, Level 1B; piano, Level 2. Those whose major performance area is a keyboard instrument or voice must complete Proficiency Level 4 on a band or orchestra instrument. One semester of Marching Band and four semesters of a major concert ensemble are required for all wind and percussion players in the curriculum. String players are expected to complete five semesters of orchestra. A recommended distribution of the courses required in this curriculum:

FIRST YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110	4	Music 110	4
Music 110 (piano)	1	Music 110 (piano)	1
Music 100 or 103	1-2	Music 100 or 103	1-2
Music 61, 62	4	Music 63, 64	4
Engl. 1	3	Music 31	1
G.P.E. 1	1	G.P.E. 2	1
Core	3	Core	3
	17-18		18-19

SECOND YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110	2	Music 110	2
Music 110 (voice)	2	Music 100 or 103	1-2
Music 100 or 103	1-2	Music 34	3
Music 33	3	Music 67, 68	4
Music 65, 66	4	Music 52	2
Music 51	1	Music 44-47	2
Music 44-47	2	Core	3
Engl. 2	3		
	18-19		17-18

THIRD YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 100 or 103	1-2	Music 152	3
Music 151	3	Music 44-47	2
Music 53	3	Ed. P. 105	3
Music 44-47	2	Core	6
Ed. P. 103	3	C&I 7	2
Core	3		
	15-16		16

FOURTH YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 115	1	C&I 104	4
Music 248	2	C&I 187	6
Hl. Ed. 102	2	C&I 188	6
Core	12		
	17		16

Minimum: 134 hr.

Accelerated Curriculums

Students wishing to complete any music curriculum in less than four years may, with the approval of the adviser and the division chairperson, accelerate their program by attending summer sessions, if appropriate courses are offered. All requirements of the four-year curriculum must be satisfied.

Combined Applied-Music Education Curriculum

An optional program can be arranged for outstanding students who desire to meet the requirements of majors in both Applied Music and Music Education. Admission to this rigorous program is by written consent of the Coordinator of the appropriate applied music area and the Coordinator of Music Education after the student has completed two semesters. This curriculum satisfies the course requirements of the Professional Certificate, Grades K-12.

The numerous possible combinations of Applied Music with Music Education cannot be listed separately here. When the student becomes a candidate for this degree, the student's adviser designates the specific courses which must be taken to satisfy the requirements for both Applied Music and Music Education. By attending summer sessions, if appropriate courses are available, it may be possible to complete the combined curriculum in four years.

Bachelor of Arts Degree

The Bachelor of Arts program in Music, an interdepartmental curriculum offered by the College of Arts and Sciences and the College of Creative Arts, provides an option for the student with an interest in music who wishes to pursue a broader liberal arts education, rather than to seek a career as a performer or teacher.

Students wishing to enter this program must have the approval of the program adviser, and must meet audition requirements in the principal performance area, which can be piano, organ, voice, or band or orchestra instrument.

The flexibility implicit in this program precludes publishing a recommended eight-semester course distribution. Unless otherwise specified, general College of Arts and Sciences and University regulations apply. Three principal areas of course work are required, as shown in the following outline:

A. *General Education*	*Hr.*
English 1, 2	6
Core A, B, C	36
Foreign Language	12
Non-Music Electives	21-28
	Minimum—75
	Maximum—82

No music courses may be included in Core A.

Of the Core requirement and non-music electives, at least 24 credit hours must be in Arts and Sciences.

Foreign Language study is in addition to the Core requirement.

International Studies or Minority Studies: Each student must meet this requirement of the College of Arts and Sciences.

Depending upon individual interest, students may select courses from areas which could provide a basis for careers in music librarianship (courses in library science), computer science, music merchandising/arts management (courses in psychology, management, marketing) or music criticism (courses in English, journalism).

B. *Musicianship*	*Hr.*
Theory (Music 61-68)	16
Literature (Music 31, 33, 34)	7
Upper-Level Music Electives (in Theory, Composition, History or Literature)	3-6
	26-29

Upper-level music electives may include either Music 130, *Music of Appalachia*, or Music 230, *Music of Africa*, which satisfy the International Studies or Minority Studies requirement.

C. *Musical Performance*	*Hr.*
Applied Music (Music 110, major performance area)	16
Concert Organization (Music 100-105) or Ensemble (Music 115)	4
Performance Electives	0-4
	20-24

Student must attain Proficiency Level 7 in the major performance area. Secondary piano proficiency is not required.

Two appearances in upper-level recitals and two semesters of recital attendance are required.

A student who is not making satisfactory progress in achieving the applied music proficiency level will be discontinued.

SUMMARY	*Hr.*
General Education	75-82
Musicianship	26-29
Musical Performance	20-24
Total	Minimum—128

No more than 42 credits in music courses (exclusive of Applied Music 110) may be counted toward graduation.

At least 30 credits overall must be at the 100-level or above.

A grade-point average of 2.0 is required for graduation.

Courses of Instruction in Music (Music)

19. *Introduction to Opera Theatre.* I, II. 0-4 hr. *(May be repeated for credit; max. 16 hr.)* PR: Consent. Practical work in all aspects of lyric theatre production. Development of lyric theatre stage technique through movement studies, performance in major and minor roles and operatic scenes, and advanced production techniques

30. *Introduction to Music.* I, II. 3 hr. *(Not open to music majors.)* Introductory course designed to develop an appreciation and understanding of the significance of music as a fine art, and to help the student develop intelligent listening habits.

31. *Introduction to Music Listening.* II. 1 hr. *(For music majors only.)* Guided listening to important works from all historical periods with emphasis upon the development of awareness of stylistic traits, such as harmonic idiom, melodic structure, tonal movement, texture, rhythm, etc.

33. *Music Literature 1.* I. 3 hr. PR: Music 31 or consent. Survey of music literature from the pre-Christian era through the Baroque.

34. *Music Literature 2.* II. 3 hr. PR: Music 31 or consent. Survey of music literature from Classicism through the twentieth century.

41. *Fundamental Music Skills.* I, II. 2 hr. *(Not open to music majors.)* Development of skills for future classroom teachers. Basic understanding of rhythm, dynamics, tone color, pitch, and form.

42. *Teaching Elementary School Music.* I, II. 2 hr. PR: Music 41 or consent. *(Not open to music majors.)* Leading and teaching of songs. Guiding children in conceptual development in music through activities approach.

44. *Woodwind Instrument Pedagogy.* I, II. 2 hr. Techniques of teaching woodwind instruments, including playing techniques, pedagogical techniques appropriate for young players, methods, materials, maintenance, and repair.

45. *Brass Instrument Pedagogy.* I, II. 2 hr. Techniques of teaching brass instruments, including playing techniques, pedagogical techniques appropriate for young players, methods, materials, maintenance, and repair.

46. *String Instrument Pedagogy.* I, II. 2 hr. Techniques of teaching string instruments, including playing techniques, pedagogical techniques appropriate for young players, methods, materials, maintenance, and repair.

47. *Percussion Instrument Pedagogy.* I, II. 2 hr. Techniques of teaching percussion instruments, including playing techniques, pedagogical techniques appropriate for young players, methods, materials, maintenance, and repair.

48. *Instrumental Pedagogy.* I. 3 hr. *(For vocal emphasis majors only.)* Techniques of teaching band and orchestra instruments, including playing techniques, pedagogical techniques appropriate for young players, methods, materials, maintenance, and repair.

49. *Vocal Pedagogy.* I. 2 hr. PR: Two semesters of voice study. Techniques of voice culture; applicable to school choral activities and instruction of young singers.

51. *Fundamentals of Conducting.* I. 1 hr. PR: Sophomore standing. Basic conducting skills, including beat patterns, expressive gestures, cues, and the fermata; terminology; application of tempo markings.

52. *Conducting and Score Interpretation.* II. 2 hr. PR: Music 51 or consent. Mechanics of choral, orchestral, and band scores; score memorization. Application of skills to the conducting of choral groups.

53. *Conducting and Rehearsing.* I, II. 3 hr. PR: Music 52 or consent. Intensive study of scores within the student's specialization (band, orchestra, or chorus). Analysis of conducting problems; rehearsal techniques.

61. *Aural Theory.* I. 2 hr. The four aural theory courses (Music 61, 63, 65, and 67) form a unit of instruction devoted to the development of aural skills such as sight-singing, melodic and harmonic dictation, identification of chords, chord progressions, modulations, and non-harmonic tones.

62. *Written Theory.* I. 2 hr. Elementary theory (scales, keys, intervals, triads, and dominant seventh chords) and introduction to diatonic harmony (part-writing and analysis).

63. *Aural Theory.* II. 2 hr. PR: Music 61. Continuation of Music 61.

64. *Written Theory.* II. 2 hr. PR: Music 62. Continuation of Music 62. Diatonic harmony including part-writing, harmonization of melodies, and harmonic analysis with triads, seventh chords, secondary dominants, and modulation. Analysis of binary and ternary forms.

65. *Aural Theory.* I. 2 hr. PR: Music 63. Continuation of Music 63.

66. *Written Theory.* I. 2 hr. PR: Music 64. Continuation of Music 64. Diatonic and chromatic harmony including part-writing, harmonization of melodies, and harmonic analysis with seventh chords, modulations, and foreign chords. Introduction to counterpoint.

67. *Aural Theory.* II. 2 hr. PR: Music 65. Continuation of Music 65.

68. *Analysis of Music.* II. 2 hr. PR: Music 66. Consideration of melody, rhythm, harmony, texture, form, etc., and how they function to produce an organic work of art. Analysis of larger musical forms and emphasis on twentieth century techniques.

100. *Band.* I, II. 0-2 hr. *(May be repeated for credit.)* Wind Ensemble, Symphonic Band, Concert Band, Marching Band, Varsity Band.

101. *Glee Club.* I, II. 0-1 hr. *(May be repeated for credit.)* PR: Consent. Open to all students by audition. Practical experience in rehearsal and public performance of choral music for men's and women's voices. *(Will not be used to fulfill ensemble requirements for music majors.)*

102. *University Choral Union.* I, II. 0-1 hr. *(May be repeated for credit.)*

103. *Orchestra.* I, II. 0-2 hr. *(May be repeated for credit.)* University-Community Symphony Orchestra, Opera Orchestra, Musical Theatre Orchestra.

105. *University Choir.* I, II. 0-2 hr. *(May be repeated for credit.)*

110. *Applied Music.* I, II. 1-4 hr. *(May be repeated for credit.)* Open to qualified students in any field. An audition for placement may be required. Credit given as follows:
1. For music majors, 2 hr. credit for each 30-minute weekly lesson.
2. For others, a maximum of one 30-minute lesson per week for 2 hr. credit.
3. Students in lower grade levels of Applied Music may be grouped in small classes for initial instruction. 1-2 hr. credit.

113. *Diction for Singers.* I, II. 2 hr. *(May be repeated for credit; max. 8 hr.)* PR: Consent. Phonetics, phonetic symbols, and pronunciation in singing in alternating semesters in English; Italian, Latin, Spanish; German; and French. Other aspects of language that will aid in comprehension of song, oratorio, and operatic texts considered.

115. *Chamber Music.* I, II. 0-1 hr. *(May be repeated for credit.)* PR: Consent. Opportunity to perform in small ensembles, including Jazz, Percussion, Woodwind, Brass, Trombone, String, Piano, and New Music.

118. *Methods and Pedagogy.* I. 1-2 hr. PR: Music 110; Junior standing.

119. *Methods and Pedagogy.* II. 1-2 hr. PR: Music 118.

129. *Folk Music of the United States.* I. (Alternate Years.) 3 hr. Introduction to the folk music of various American cultural groups in historical context. Comparative analysis of representative tunes and texts.

130. *Music in Appalachia.* I. (Alternate Years.) 3 hr. *(Not open to music majors.)* Survey of traditional instrumental and vocal music of southern Appalachia. History, style characteristics, and performance techniques involving live and recorded examples emphasizing those found in West Virginia.

135. *Music in Western Culture.* I. 3 hr. PR: Music 30 or consent. *(Not open to music majors.)* A survey of western music from early Christian times to the twentieth century with special emphasis upon cultural and social relationships.

136. *Music of the Modern Age.* II. 3 hr. PR: Music 30 or consent. *(Not open to music majors.)* A survey of western music of the twentieth century from Debussy to recent years, emphasizing stylistic, historical, and cultural facets.

137. *Great Composers.* I. 3 hr. PR: Music 30 or consent. *(Not open to music majors.)* A study of major works by a chosen composer or group of composers.

138. *Introduction to History of Jazz.* II. 3 hr. PR: Music 30 or consent. An introduction to jazz, its characteristics, important performers, and their music, including an historical survey with attention to the changing style of the music.

151. *Music Education Methods and Materials 1.* I. 3 hr. PR: Music 51. Methods, materials, and administration of K-12 music programs, focusing on the student's specialization. Sequential, conceptual, and skill development; emphasis on aural and reading competencies in music. Weekly laboratory arranged.

152. *Music Education Methods and Materials 2.* II. 3 hr. PR: Music 51. Continuation of Music 151. Emphasis on teaching areas outside the student's specialization. Weekly laboratory arranged.

160. *Composition.* I, II. 2 hr. PR: Music 68 or consent. *(May be repeated for credit; max. 8 hr.)* Creative writing.

171. *Instrumentation.* I. 2 hr. PR: Music 64. Study of characteristics of band and orchestral instruments and their use in scoring.

172. *Orchestration and Band Arranging.* II. 2 hr. PR: Music 171. Problems in scoring for orchestra and band.

173. *Jazz Harmony.* II. 2 hr. PR: Music 68 or consent. Introduction to jazz theory and harmony. Jazz nomenclature. Basic skills in ear training, chord voicing and substitution, and melody writing.

200. *Directed Music Studies.* I, II, S. 1-4 hr. *(May be repeated for credit.)* PR: Consent. Studies in applied music, music education, music theory, music history, composition; includes directed or independent study in special topics.

210. *Piano Class Methods and Materials.* I. 3 hr. Methods, materials, and pedagogical techniques, including presentation of keyboard theory as used in functional piano. Practical organization of piano classes. Laboratory: Observation of experienced class teacher and student teaching. *(Course will not be offered in 1986-87.)*

212. *History of Keyboard Pedagogy and Technic.* II. 3 hr. Study of keyboard development and technique, including pedagogical works of the eighteenth through twentieth centuries and application to specific teaching problems. Laboratory: Student teaching and observation, emphasizing analysis and solution of technical problems.

213. *Introduction to Jazz Improvisation.* I. 2 hr. PR: Music 63, 64 and Proficiency Level 4. Development of improvisatory skills in the jazz idiom using melodic, harmonic, and rhythmic motives and patterns, and the application of knowledge of tonal centers, chord progressions, and junctions.

214. *Advanced Jazz Improvisation.* II. 2 hr. PR: Music 213 or consent. Continuation of Music 213. Analysis of chord progressions with emphasis on chord substitutions, turnbacks, and scales. Development of jazz repertoire through performance.

218. *Repertoire.* I. 0-2 hr.

219. *Repertoire.* II. 0-2 hr.

221. *Music Before 1500.* I, II, or S. 3 hr. PR: Music 33-34 or consent. A study of sacred and secular monophony, Notre Dame organa, thirteenth-century motet and conductus, and fourteenth and fifteenth-century polyphony in France and Italy. *(Course will be offered in Spring, 1986-87.)*

222. *Music of the Sixteenth and Seventeenth Centuries.* I, II, or S. 3 hr. PR: Music 33-34 or consent. A study of styles and forms from the High Renaissance to the late Baroque. *(Course will be offered in Summer II, 1987.)*

223. *Music of the Eighteenth Century.* I, II, or S. 3 hr. PR: Music 33-34 or consent. A study of styles and forms of the Late Baroque through the Classic period. *(Course will be offered in Fall, 1987-88.)*

224. *Music of the Nineteenth Century.* I, II, or S. 3 hr. PR: Music 33-34 or consent. A study of styles, forms, and theoretical concepts illustrative of nineteenth-century music. *(Course will be offered in Summer II, 1986.)*

225. *Music of the Twentieth Century.* I, II, or S. 3 hr. PR: Music 33-34 or consent. A study of stylistic trends during the twentieth century. *(Course will be offered in Fall, 1986-87.)*

230. *Music of Africa.* II. 3 hr. Traditional music of selected areas of Africa south of the Sahara with particular reference to East Africa. The diverse musical cultures with

emphasis on historical background, instruments, ensembles, forms, styles, and music in its social context.

239. *Collegium Musicum.* I, II. 1-2 hr. *(May be repeated for credit.)* PR: Consent. Study of outstanding musical works not in the standard repertory. Performance of vocal and instrumental music, investigation of performance practices, preparation of editions, and direction of rehearsals under supervision.

240. *Clinic Chorus, Band, and Orchestra.* I, II. 1 hr. Experience in selection, preparation, and class performance of music appropriate for high school choral and instrumental groups. *(Course will not be offered in 1986-87.)*

243. *Music Workshops.* I, II, S. 1-2 hr. *(May be repeated for credit.)*

245. *Marching Band Techniques.* I. 2 hr. PR: One semester college marching band experience or consent. Study and practical application of techniques of planning and preparation of school marching band performances. *(Course will not be offered in 1986-87.)*

248. *Music Arranging for Public School Groups.* I, II. 2 hr. PR: Music 66. Practical experience in techniques of making simple, workable arrangements of music for public school choral and instrumental performance groups.

260. *Upper-Division Composition.* I, II. 2 hr. *(May be repeated for credit.)* PR: Two semesters Music 160, or consent based on scores submitted. Creative writing with emphasis on practical composition for performance.

263. *Counterpoint.* I. 2 hr. PR: Music 68 or consent. Sixteenth century counterpoint.

264. *Counterpoint.* II. 2 hr. PR: Music 68 or consent. Eighteenth century counterpoint.

265. *Analysis of Musical Form.* II. 3 hr. PR: Music 68 or consent. Detailed study of the structure of music.

266. *Major Project in Theory, Composition, or Music History.* I, II. 2 hr. *(Not available for Graduate credit.)* PR: Music 68.

267. *Electronic Music.* I. 2 hr. PR: Music 68 and consent. Technology of producing electronic music. Methods of producing electronic compositions, relationship between sound signal and sound perceived, ear training, analysis of examples from electronic music literature, and composition of electronic music.

268. *Electronic Music.* II. 2 hr. PR: Music 267. Continuation of Music 267.

273. *Arranging for Small Jazz Ensemble.* I. 2 hr. PR: Music 171, and Music 173 or consent. Scoring, voicing, and arranging in various jazz styles, with emphasis on small ensembles comprising three to nine players.

274. *Arranging for Large Jazz Ensemble.* II. 2 hr. PR: Music 273 or consent. Continuation of Music 273, with emphasis on arranging for big band and studio jazz ensemble.

299. *Recital.* I, II. 0-2 hr. *(Not available for Graduate credit.)* To be used to fulfill the applied major graduation requirement only when the student has achieved Proficiency Level 9. Students who have reached Level 6 may receive 1 hour credit, which may not be used to fulfill the graduation recital requirement.

310. *Secondary Applied Music.* I, II, S. 1 hr. *(May be repeated for credit.)* Group or individual instruction on a minor instrument (or voice), with emphasis on methods and materials for school music teachers.

312. *Keyboard Performance and Pedagogy.* I, II. 1-3 hr. *(May be repeated for credit.)* (Offered in 1-credit modules of which students may take one or more each semester.) Pedagogy, repertoire, interpretation, and other topics which will enhance preparation of private piano teachers.

335. *Survey of Vocal Music.* I. 3 hr. PR: 6 hr. upper-division music history. Survey of masses, oratorios, cantatas and operas from late Renaissance to the twentieth century. Solo repertoire will not be included. *(Course will not be offered in 1986-87.)*

336. *Survey of Instrumental Music.* II. 3 hr. PR: 6 hr. upper-division music history. Survey of instrumental ensemble music, concertos, symphonies, and other orchestral music from late Renaissance to the twentieth century. Solo repertoire will not be included. *(Course will not be offered in 1986-87.)*

341. *Music in the Elementary School.* II. 3 hr. PR: Music 30, 41, 42, or equiv. *(Not open to music majors.)* Development of skills, procedures, techniques, and materials used by the general classroom teacher of music in grades K-8. *(Course will not be offered in 1986-87.)*

342. *Teaching of Music Appreciation.* I. 3 hr. PR: Music 30, 41, 42, or equiv. *(Not open to music majors.)* Review of information, materials, sources, and techniques involved in teaching appreciation of music in public schools. *(Course will not be offered in 1986-87.)*

343. *Contemporary Techniques in Classroom Music.* S. 3 hr. PR: Music 152 or consent. Principles and practice of contemporary techniques in elementary and junior high school classroom music, including those of Orff and Kodaly. *(Course will not be offered in Summer 1986.)*

344. *Appalachian Music for the Classroom.* I. 3 hr. Lecture, demonstration, and practical experience of Appalachian vocal and instrumental music, and in use of this music in public school classrooms. May involve field trips and construction of inexpensive instruments.

346. *Musicmaking in Middleschool/Junior High.* I. 3 hr. PR: Music 151, 152, equiv., or consent. Identification and sequencing of appropriate concepts and skills for general music class students. Selection and use of materials including popular music. Emphasis on student music-making activities. Evaluation procedures included.

347. *Music in Early Childhood.* I. 3 hr. PR: Music 151, 152, equiv., or consent. Musical experiences for children three through ten years. Emphasis on intellectual, physical and social/emotional needs and characteristics of children. Materials and activities for developing music concepts, skills, and positive response. *(Course will not be offered in 1986-87.)*

Division of Theatre

The Division of Theatre offers an intensive training program in theatre for the student who seeks artistic growth and development. The four-year course of study, leading to the Bachelor of Fine Arts (B.F.A.) degree, is designed for those students who intend to pursue professional theatre careers, as well as those who may enter other fields where theatre skills are desirable.

The various curriculums combine formal classes in theory with practical application and experience in the Division's theatre, studio, and shop areas. Public performances offer the student numerous opportunities to develop personal performance skill. Productions cover a wide range of world theatre, including classical and modern works, children's and puppet plays, new scripts, and selections from the musical theatre repertoire.

The theatre major may choose one of four different areas of emphasis, each of which provides a well-rounded knowledge of the art as well as an opportunity to specialize. Graduates of the division are employed in the

professional theatre, radio, television, and film; some have chosen careers in fashion design, commercial sales work, make-up, lighting design, and other areas in which threatre skills provide a unique advantage.

Performances. The division annually produces eight to ten major productions and numerous laboratory performances in its three principal performance areas: the Concert Theatre, Studio Theatre, and Classroom Theatre. These productions, spanning a wide range of performance styles, provide practical experience for theatre students and serve as a cultural outlet for the community. In addition, the division occasionally takes productions on tour to other parts of the state, and regularly produces children's theatre productions for area school children. An opera is annually co-produced with the Division of Music, and the well-known Puppet Mobile tours the state from September through April.

Bachelor of Fine Arts in Theatre

The Bachelor of Fine Arts (B.F.A.) is conferred upon any student who complies with the general regulations of the University concerning degrees, satisfies all entrance and divisional requirements, and completes one of the curriculums of the Division of Theatre with a 2.0 (C) grade-point average:

A. Acting
B. Design and Technical Theatre
C. Musical Theatre
D. General Theatre

For admission to the junior year of the Division of Theatre, a student must have established a 2.0 (C) grade-point average.

Transfer students must establish transfer credit from other institutions during the first semester in which they are enrolled in the Division of Theatre. Those electing the Musical Theatre curriculum must arrange an audition in the fall before actually commencing work in the program.

Students are responsible for correctly fulfilling all requirements. Each student should review the course requirements both before and after every registration period so that errors or omissions will be detected immediately.

Teacher Certification

Although there is no teacher certification with a speciality in theatre, students planning to teach theatre at the high school level will pursue certification in oral communication, which may include course work in theatre.

Suggested Programs of Study

ACTING

FIRST YEAR				SECOND YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Theatre 75	3	Theatre 76	3	Theatre 175	3	Theatre 176	3
Theatre 100 or 105	4	Theatre 105 or 100	4	Theatre 51	3	Theatre 52	3
Art 30 or Music 30	3	Theatre 95	3	Theatre 110	3	Theatre 200 (Movement)	3
Engl. 1	3	Core B	3	Theatre 200 (Movement)	3	Theatre 179	2
Core B	3	Core C	3	Theatre 179	2	Theatre 296 or 298	3
Core C	3	Music 30 or Art 30	3	Theatre 295 or 297	3	Engl. 2	3
	19		19		17		17

THIRD YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Theatre 177	3	Theatre 178	3
Theatre 150	3	Theatre 151	3
Theatre 200 (Movement)	3	Theatre 200 (Movement)	3
Theatre 297 or 295	3	Theatre 298 or 296	3
Core B	3	Core C	3
	15		15

FOURTH YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Theatre 275	3	Theatre 276	3
Theatre 250	3	Theatre 251	3
Theatre 200 (Movement)	3	Theatre 200 (Movement)	3
Theatre 260	2	Theatre 260	2
Core B	3	Core C	3
	14		14

Total: 130 hr.

DESIGN AND TECHNICAL THEATRE

FIRST YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Theatre 74	3	Theatre 95	3
Theatre 100 or 105	4	Theatre 105 or 100	4
Art 121 or 11	3	Art 122 or 12	3
Engl. 1	3	Core C	3
Core B	3	Core B	3
G.P.E.	1	G.P.E.	1
	17		17

SECOND YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Theatre 110	3	Theatre 107	3
Theatre 220	3	Theatre 221	3
Theatre 161	3	Theatre 168	3
Theatre 167	3	Theatre 201	3
Theatre 179	2	Theatre 205	3
Engl. 2	3	Core C	3
	17		18

THIRD YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Theatre 206	3	Theatre 267	3
Theatre 262	3	Theatre 296 or 298	3
Theatre 260	2	Core C	3
Theatre 267	3	Theatre 180	3
Theatre 295 or 297	3	Theatre 223 or 225	3
Core B	3		
	17		15

FOURTH YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Theatre 260	2	Theatre 267	3
Theatre 267	3	Core C	3
Theatre 297 or 295	3	Theatre 298 or 296	3
Core B	3	Electives	6
Music 30	3		
	14		15

Total: 130 hr.

GENERAL THEATRE

FIRST YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Theatre 75	3	Theatre 95	3
Theatre 100 or 105	4	Theatre 105 or 100	4
Art 30	3	Core B or Engl. 1	3
Engl. 1 or Core B	3	Elective	3
P.E.	1	Core C	3
Core C	3	Dance 4	1
	17		17

SECOND YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Theatre 106	3	Theatre 166	2
Theatre 110	3	Theatre 179	2
Theatre 179	2	Theatre elective*	3
Core B	3	Core B or Engl. 2	3
Engl. 2 or Core B	3	Music 30	3
Theatre elective*	3	Core C	3
	17		16

THIRD YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Theatre 107	3	Theatre 180	3
Theatre 295 or 297	3	Theatre 260	2
Theatre elective*	3	Theatre 296 or 298	3
Engl. 150	3	Theatre elective*	3
Core B	3	Elective	3
		Core C	3
	15		17

FOURTH YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Theatre 260	2	Theatre 260	2
Theatre 290	3	Theatre 298 or 296	3
Theatre 297 or 295	3	Theatre elective*	3
Theatre elective*	3	Electives	6
Electives	6		
	17		14

*At least three hours of theatre electives must be selected from the following courses: Theatre 200 (Childrens' Theatre Workshop), Theatre 282, and Theatre 284.

Total: 130 hr.

MUSICAL THEATRE

FIRST YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Theatre 75	3	Theatre 76	3
Core B	3	Theatre 95	3
Theatre 100 or 105	4	Theatre 105 or or 100	4
Music 41	2	Dance 9	1
Mus. 110 (Voice)	2	Core B	3
Engl. 1	3	Core C	3
Dance 4	1		
	18		17

SECOND YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Theatre 175	3	Theatre 176	3
Theatre 110	3	Theatre 52	3
Core C	3	Core B	3
Mus. 110 (Voice)	3	Engl. 2	3
Theatre 51	3	Mus. 110 (Voice)	2
Dance 210	2	Mus. 110 (Piano)	2
		Dance 211	2
	17		18

THIRD YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Theatre 177	3	Theatre 178	3
Theatre 295 or 297	3	Theatre 296 or 298	3
Theatre 240	2	Theatre 241	2
Theatre 150	3	Dance 213	2
Dance 212	2	Theatre 179	2
Music 102 (Choral Union)	1	Theatre 151	3
Theatre 179	2		
	16		15

FOURTH YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Theatre 295 or 297	3	Theatre 296 or 298	3
Theatre 260	3	Theatre 260	2
Core C	3	Core C	3
Electives	6	Elective	3
		Core B	3
	15		14

Total: 130 hr.

Courses of Instruction in Theatre (Theat.)

30. *Appreciation of Theatre.* I, II. 3 hr. *(Open to all students.)* Develops an appreciation and understanding of theatre as a fine art.

50. *Oral Interpretation.* I, II. 3 hr. *(Open to all students.)* Development of mental and emotional responsiveness to written materials. Techniques of communicating through oral reading.

51. *Vocal Techniques 1.* I. 3 hr. Concentration on the basic techniques of vocal production: relaxation, posture, body balance, breathing capacity, and facial muscularity and dexterity.

52. *Vocal Techniques 2.* II. 3 hr. PR: Theat. 51. Continuation of Theat. 51: resonance and projection, articulation and pronunciation acuity.

74. *Acting.* I, II. 3 hr. *(Open to all students.)* Basic theories and concepts in stage acting for the beginning student. Emphasis on the physical, intellectual, emotional, and personality languages of acting.

75. *Acting 1.* I. 3 hr. PR: Theatre major. Stimulation of direct and personal contact with elements of stage reality (place, activity, relationship, convention, movement, etc.), and conditioning of the actor for future work through use of improvisation and threatre games.

76. *Acting 2.* II. 3 hr. PR: Theat. 75. Continuation of Theat. 75.

95. *Basic Theatre Concepts.* II. 3 hr. Theatrical concepts based upon an examination of historical conventions and play analysis.

100. *Fundamentals of Technical Theatre.* I, II. 4 hr. Fundamentals of scenery construction and lighting through formal lecture and practical crew experience. Laboratory requirements include assignments on construction and running crews.

105. *Fundamentals of Costume Construction.* I, II. 4 hr. Fundamentals of costume construction through formal lecture and practical crew experience. Laboratory requirements include assignments on costume construction and running crews.

106. *Fundamentals of Theatre Design.* I. 3 hr. Fundamentals of costume and scenery design, its aesthetics and process. *(Course will not be offered in 1986-87.)*

107. *Fundamentals of Theatre Lighting.* I, II. 3 hr. PR: Theat. 100, 105. Basic technique in stage lighting. Practical experience on University Theatre lighting crews.

110. *Theatre Makeup.* I, II. 3 hr. Lecture-laboratory course in art of stage makeup. Practical makeup for University Theatre productions.

150. *Vocal Techniques 3.* I. 3 hr. PR: Theat. 51, 52. Application of the basic techniques of vocal production in prose literature and drama.

151. *Vocal Techniques 4.* II. 3 hr. PR: Theat. 51, 52, 150. Continuation of Theat. 150.

161. *Sceno-Graphic Techniques.* I. 3 hr. PR: Theat. 106. Study of drafting conventions in scenery, lighting, costumes, and properties. Emphasis on problem-solving through professional presentation.

166. *Theatre Management.* I, II. 2 hr. Practical experience in operation of a box office and the handling of promotion for theatre productions.

167. *Theatre Design 1.* I. 3 hr. PR: Theat. 106. Study of costume and stage design through various rendering techniques.

168. *Theatre Design 2.* II. 3 hr. PR: Theat. 167. Study of theatrical design and the development of design styles through various rendering techniques.

175. *Acting 3.* I. 3 hr. PR: Theat. 76. Exploration of the Stanislavsky System through exercises, improvisation, and scene work.

176. *Acting 4.* II. 3 hr. PR: Theat. 175. Continuation of the exploration of the Stanislavsky System with emphasis on character.

177. *Acting 5.* I. 3 hr. PR: Theat. 176. Seeks to present advanced theories in acting to include script analysis, modern and historical, and to train the actor in advanced skills. Concentration upon broadening the actor's range.

178. *Acting 6.* II. 3 hr. PR: Theat. 177. Extensive and intensive study of acting styles.

179. *Directed Theatre Activities.* I, II. 0-3 hr. *(May be repeated for max. of 6 hr. credit.)* PR: Consent. Assigned theatre projects supervised by faculty.

180. *Directing.* I, II. 3 hr. Fundamentals of directing stage plays. Emphasis on the work of the director in relation to the actor, stage, business, composition, movement, and rehearsal schedule.

200. *Directed Theatre Studies.* I, II. 3-12 hr. *(May be repeated for max. 12 hr. credit.)* PR: Consent. Studies in theatre history, performance, stage design and technology, and theatre crafts. Subject matter and number of sections varies from semester to semester.

201. *Advanced Costume Construction.* I, II. 3 hr. *(May be repeated for max. 12 hr. credit.)* PR: Theat. 105. Study and practical application of costume construction through flat pattern, draping, and period pattern projects. Production assignments on theatre productions.

203. *Advanced Theatre Lighting Design.* I. 3 hr. PR: Theat. 103 or consent. Advanced theories of lighting and design for the stage. Practical experience with advanced lighting equipment. *(Course will not be offered in 1986-87.)*

205. *Advanced Technical Theatre.* I, II. 3 hr. *(May be repeated for max. 6 hr. credit.)* PR: Theat. 106, 107. Detailed study of scenery construction. Research projects, drawings, technical welding, properties construction, and study of new materials. Practical experience through work on productions.

206. *Stage Management.* I, II. 3 hr. PR: Theat. 106, 107, or consent. Detailed study of the role of the stage manager. Some stage management of Division of Theatre productions may be required.

210. *Theatre Dance 1.* I. 2 hr. PR: Dance 9. Develops a basic practical knowledge of choreographed movement in the musical theatre dance idiom. Includes a study of fundamentals of ballet for the actor, derivative musical/rhythmic forms, and elementary Broadway dance vocabulary and styles. *(Also listed as Dance 210.) (Course will not be offered in 1986-87.)*

211. *Theatre Dance 2.* II. 2 hr. PR: Theat. 210/Dance 210. Comprehensive study of representative musical theatre dance styles, relative to period (1900 to present) and ethnic derivation. Includes study of isolationary movement and principles of classical dance applicable to the Broadway idiom. *(Also listed as Dance 211.) (Course will not be offered in 1986-87.)*

212. *Theatre Dance Repertory.* I. 2 hr. PR: Theat. 211/Dance 211. Develops and expands the technical and stylistic fundamentals established in the Dance 210-211/Theat. 210-211 courses, applying them to reconstruction and staging of a variety of classic dance sequences from notable Broadway musicals. *(Also listed as Dance 212.) (Course will not be offered in 1986-87.)*

213. *Theatre Dance Performance Workshop.* II. 2 hr. PR: Theat. 212/Dance 212. Continues study of dance technique, isolationary movement and stylistic vocabularies established in previous theatre dance courses. Emphasizes development of original choreography in representative Broadway dance styles. Includes study of elements of performance in musical theatre. *(Also listed as Dance 213.) (Course will not be offered in 1986-87.)*

220. *Costume History 1.* I. 3 hr. Detailed study of modes and manners in dress from ancient Egypt through the Renaissance.

221. *Costume History 2.* II. 3 hr. Detailed study of modes and manners in dress from the late Renaissance to the present.

223. *Costume Crafts.* II. 3 hr. PR: Theat. 105, 201. Workshops conducted by faculty members, graduate students, visiting artists, and class members, using skills previously learned and providing "hands-on" experiences with a variety of materials and techniques.

225. *Theatrical Rigging and Electricity.* II. 3 hr. PR: Theat. 100, 107. A detailed study of the rigging systems used on the stage and of electricity as it relates to stage lighting.

240. *Acting: Music Theatre.* I. 2 hr. PR: Consent. *(Open to applied music majors in voice.)* Training in musical and dramatic performance with emphasis upon dramatic form and repertoire.

241. *Singing: Musical Theatre.* II. 2 hr. PR: Theat. 240. *(Open to applied music majors in voice.)* Training in musical and dramatic performance with emphasis upon musical theatre form and repertoire.

250. *Advanced Problems of Vocal Production.* I. (Alternate Years.) 3 hr. PR: Consent. Concentration on the voice and special problems of production, particularly vocal. Dialects and specific character vocal qualities.

251. *Vocal Production Performance.* II. (Alternate Years.) 3 hr. PR: Consent. The amalgamation and synthesis of all the vocal skills of performance incorporated in original theme productions.

260. *Theatre Performance and Rehearsal Laboratory.* I, II. 1-3 hr. *(May be repeated for max. 9 hr. credit.)* PR: Theatre major and consent. Participation is assigned theatre projects. Appreciation of creativity and performance techniques in theatre.

262. *Scene Painting.* I. 3 hr. PR: Theat. 168 or consent. A study in the basic techniques used in preparing and painting scenery. Practical experience in painting scenery for theatre productions.

267. *Advanced Problems in Theatre Design.* I, II. 3 hr. *(May be repeated for a max. 12 hr. credit.)* PR: Theat. 167, 168. A detailed study of costume and set design through in-depth design projects.

275. *Acting 7.* I. 3 hr. PR: Theat. 178. Scene study, using texts from selected historical periods.

276. *Acting 8.* II. 3 hr. PR: Theat. 275. Continuation of Theat. 275.

278. *Repertory Theatre.* 1-6 hr. *(May be repeated for max. 12 hr. credit.)* PR: Consent. Rehearsal and performance techniques for producing plays in rotating repertory. Emphasis is on the creation of a synthesized company of performers, designers, and technicians.

280. *Advanced Play Directing.* II. 3 hr. PR: Theat. 180 or consent. Emphasis on the work of the director as on integrating artist. High level of proficiency in the direction of a one-act play is required of all students enrolled.

282. *Creative Dramatics.* I, II, S. 3 hr. PR: Theat. 75 or consent. Study and practice of creative dramatic activity as a method of learning and self-development for children.

284. *Puppetry.* I, II. 3 hr. PR: Theat. 75 or consent. Comprehensive survey of construction and manipulation techniques of puppets. Evaluation of the role of puppetry in child behavior and therapy techniques.

290. *Playwriting.* I, II. 3 hr. PR: Consent. Development of basic playwriting techniques. Specific assignments explore characterization, dramatic event, dialogue, tension, compression. Emphasis on the student finding one's own voice, style, and courage to dramatize one's view of the world.

291. *Advanced Playwriting.* II. 3 hr. PR: Theat. 290. Further exploration of dramatic technique, with emphasis on orchestrating the longer play. Also touches on script analysis of known dramatic texts and on practical problems of a playwriting career.

295. *Classic Theatre to 1700.* I. (Alternate Years.) 3 hr. A survey of theatre history, with emphasis on the development of performance conditions, from classical antiquity through the middle of the seventeenth century.

296. *European and American Theatre, 1700-1850.* II. 3 hr. A survey of theatre history, with emphasis on the development of performance conditions, from the middle of the seventeenth century to the rise of Realism in the 1840s.

297. *Modern Theatre, 1850-1940.* I. (Alternate Years.) 3 hr. A survey of theatre history, with emphasis on the development of performance conditions, from the middle of the nineteenth century to the outbreak of World War II. *(Course will not be offered in 1986-87.)*

298. *Contemporary Theatre Since 1940.* II. (Alternate Years.) 3 hr. A survey of theatre history, with emphasis on the development of performance conditions, from World War II to the present. *(Course will not be offered in 1986-87.)*

307. *Light and Sound Seminar.* II. 3 hr. PR: Theat. 203 or equiv. An in-depth exploration of advanced lighting and sound for the theatre with particular emphasis on repertory lighting, dance, and opera.

331. *Research Methods and Survey.* I. 3 hr. PR: Consent. Research methods and techniques for theatre artists, scholars, and designers.

332. *Auditions and the Acting Profession.* I. 3 hr. PR: Theat. 376. Study of audition techniques, employment, unions, requirements of Actors' Equity Association. *(Course will not be offered in 1986-87.)*

333. *Seminar in Production Research.* II. 3 hr. PR: Theat. 331, 367. Seminar approach to individual design projects with oral and written presentation of research materials. Intensive critique within class by faculty and peers. *(Course will not be offered in 1986-87.)*

334. *Theatre Design—Portfolio Preparation.* I. 3 hr. PR: Theat. 307, 333. An in-depth work in packaging and presentation of portfolio work, job opportunities, and preparation for professional union examinations.

362. *Styles of Production Design.* I. 3 hr. PR: Theat. 295, 296, or consent. Extensive and intensive study of production styles in costume, lighting, and scene design.

367. *Theatre Design.* I. 3 hr. *(May be repeated for max. 9 hr. credit.)* PR: Theat. 267 or equiv. A lecture/studio course in scenery and costumes. Intense practical experience in drawing, painting and model building for portfolio presentation.

375. *Acting Technique 1.* I. 3 hr. PR: Consent. To provide a structured repetition exercise in order to free the impulses of the advanced actor. Independent activities, justification, and moment to moment work are introduced. Amending scene work required.

376. *Acting Technique 2.* II. 3 hr. PR: Theat. 375. To refine the daydream work for the practiced actor. The incorporation of emotional preparation to develop the ability to retain inner life with adjustment. Amending scene work required.

377. *Acting Technique 3.* I. 3 hr. PR: Theat. 376. Advanced interpretation work, emphasizing physical alteration and character idea for the seasoned actor. Internal independent activities taught with the single actor exercise. Amending scene work required.

378. *Acting Technique 4.* II. 3 hr. PR: Theat. 377. Detailed study of text to include dialogue justification and particularization for the trained actor. Extensive monologue work and amending scene work required.

379. *Rehearsal and Performance.* I. 3 hr. *(May be repeated for max. 12 hr. credit.)* PR: Consent. Participation in assigned performance projects.

381. *Period Acting.* II. 3 hr. PR: Theat. 377. Creating and sustaining characters and action in texts from major theatrical periods. *(Course will not be offered in 1986-87.)*

382. *Dialects.* II. 3 hr. PR: Theat. 375. The study of common dialects used in the theatre supplemented by the International Phonetic Alphabet as a tool for vocal work. *(Course will not be offered in 1986-87.)*

386. *Drama Criticism and Aesthetics.* II. 3 hr. Survey of chief critican and aesthetic theories of theatre—ancient, modern, and contemporary.

395. *Period Style 1.* I. 3 hr. PR: Theat. 167 or equiv. An in-depth exploration of architecture, costumes, customs, and ornamentation in period style for the theatre from Egyptian through Renaissance.

396. *Period Style 2.* II. 3 hr. PR: Theat. 395 or equiv. An in-depth exploration of architecture, costumes, customs, and ornamentation in period style for the theatre from the Baroque to the present.

School of Dentistry

Dental Hygiene Program

The Dental Hygiene Program is a department of the School of Dentistry. The four-year dental hygiene curriculum combines the advantages of both a liberal arts and professional education. Upon completion of all requirements and with the recommendation of the School of Dentistry, the candidate is awarded a degree of Bachelor of Science in Dental Hygiene (B.S.).

The Dental Hygiene curriculum is structured in accordance with standards specified for a dental hygiene program by the Commission on Accreditation of the American Dental Association. The WVU program has been fully accredited by this organization since 1965.

Admission

Students enter dental hygiene as freshmen, and the general admission policies of WVU are followed. The applicant must be a graduate of an accredited high school or preparatory school and have completed 1 unit of plane geometry, biology, and chemistry, 2 units of algebra, and 4 units of English. Good grades are expected, and applicants should rank in the upper one-third of their graduating class. Particular attention is given to academic achievement in science courses.

The American College Testing Program (ACT) examination is required of high school applicants. A high school counselor can supply information concerning this examination.

In addition to a special application form for dental hygiene, each candidate for admission is supplied with three standardized reference forms. Each applicant is required to have one dental hygienist and two other individuals return the forms directly to the Department of Dental Hygiene.

The personal qualifications, scholastic record, test scores, and recommendation of each applicant are reviewed by the Dental Hygiene Admissions Committee. After reviewing these credentials, the committee will request an interview with those applicants who are most qualified. The applicant will be notified by letter of the date, time, and place of the interview.

The competition for entrance into dental hygiene is extremely keen. *Nonresidents should recognize that preference in admissions is given to West Virginia residents. Only those nonresidents with the highest qualifications will be considered.*

For application materials the applicant should write to: Department of Dental Hygiene, West Virginia University, Morgantown, WV 26506; or the Office of Admissions and Records, WVU Medical Center, Morgantown, WV 26506. Applicants should apply and complete aptitude tests as early as possible in the year preceding the year admission is desired. Applications are available in September and are not accepted after March 1.

(Complete information concerning the Dental Hygiene program at WVU may be obtained in the *WVU Medical Center Catalog.*)

College of Engineering

Engineering is the profession in which a knowledge of the mathematical and natural sciences gained by study, experience, and practice is applied with judgment to develop ways of economically utilizing the materials and forces of nature for the benefit of mankind.

The western world, and especially the United States, often has been characterized as a technological society. This phrase reflects the great impact that engineering has had on western society. Forecasts of the expected state of the world by the year 2000 suggest that large-scale systems will be created for the development, control, and use of our natural resources and that development will continue in automated manufacturing, synthetic foods, rapid transportation systems, space programs, defense systems, energy technology, and biosocial systems having to do with medical advances, housing, community development, and pollution control. Engineering will play the major role.

Society's needs in the decades ahead will demand engineering talent on a scale never before seen. The engineer will be called upon, not only to create, but to coordinate technological advances more effectively into large-scale social systems such as vast metropolitan complexes.

The College of Engineering programs are administered through five departments: Chemical Engineering, Civil Engineering, Electrical Engineering, Industrial Engineering, and Mechanical and Aerospace Engineering. Its undergraduate programs are recognized by industry as ranking with the best in the nation. The curricula have been planned to give the student a balanced background in the basic sciences, engineering sciences, engineering analysis, the humanities, and the social sciences. In addition, each curriculum features creative programs in engineering synthesis and design. This blend of science and practice has been developed to give the student the tools to solve today's problems and the background to develop the expertise needed for the future.

The College of Engineering staff uses modern teaching techniques, including programmed material, guest lectures by visiting authorities, and team project and in-house industrial assignments to provide a breadth of training experiences.

Teaching laboratories are equipped with modern instruments, machines, and tools to improve and enrich the student's understanding of engineering principles and problems. Analog and digital computer laboratories and facilities are available for classroom work.

Graduate programs, dedicated to the development of engineering practice, engineering science, and research, are offered in numerous creative specialities. Both master's and doctor's degrees are offered. These exciting programs, where the frontiers of knowledge are explored through study and research, provide an academic environment in which all programs—undergraduate and graduate—are updated constantly to give the student the professional education needed in a technolgical-scientific society.

EAC/ABET Accreditation

The Accreditation Board for Engineering and Technology (ABET) is recognized by the U.S. Department of Education and the Council on Post-secondary Accreditation (COPA) as the sole agency responsible for accreditation of educational programs leading to degrees in engineering. ABET accomplishes its accreditation mission through one of its commissions, the Engineering Accreditation Commission (EAC).

ABET, through its participating bodies (American Academy of Environmental Engineers, American Congress on Surveying and Mapping, American Institute of Aeronautics and Astronautics, Inc., American Institute of Chemical Engineers, American Institute of Industrial Engineers, Inc., American Institute of Mining, Metallurgical and Petroleum Engineers, American Nuclear Society, American Society of Agricultural Engineers, American Society of Civil Engineers, American Society for Engineering Education, American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., The American Society of Mechanical Engineers, The Institute of Electrical and Electronics Engineers, Inc., National Council of Engineering Examiners, National Institute of Ceramic Engineers, National Society of Professional Engineers, Society of Automotive Engineers, Society of Manufacturing Engineers, and Society of Naval Architects and Marine Engineers) is concerned with the enhancement of the status of the engineer and the engineering profession, and the establishment of criteria and standards for accreditation of engineering programs at colleges and universities.

All baccalaureate degree granting programs in the College of Engineering at West Virginia University are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.

Faculty

College of Engineering—Administration

Curtis J. Tompkins, Ph.D. (Ga. Tech.)—*Dean.* Engineering management, Statistical modeling, Strategic planning.

Fred W. Beaufait, P.E., Ph.D. (VPI&SU)—*Associate Dean for Academic Affairs and Research.* Reinforced concrete, Structural analysis and design.

Thomas R. Long, Ed.D. (WVU)—*Assistant Dean for Academic Affairs.* Mechanical design, Mechanisms.

William H. Wetmore, M.S.M.E. (Lehigh U.)—*Assistant Dean for Research.* Mechanical design, Propulsion systems.

Migri Prucz, B.S.C.E. (Technion—Israel)—*Assistant to the Dean for Facilities.* Structural design, Construction management.

Engineering Experiment Station—Administration

Curtis J. Tompkins, Ph.D. (Ga. Tech.)—*Director.* Engineering management, Statistical modeling, Strategic planning.

Chemical Engineering

Professors

Richard C. Bailie, Ph.D. (Iowa U.). Biomass pyrolysis, Fluidization, Thermal processes.

Harold V. Fairbanks, M.S. (Mich. St. U.).—*Emeritus.*

Alfred F. Galli, M.S. (WVU). Heat transfer, Process design, Chemical processing of coal.

Joseph D. Henry, Jr., Ph.D. (U. Mich.)—*Chair.* Separation processes: Solid/liquid separations, Biochemical separations, Surface and colloid phenomena.

Hisashi O. Kono, Dr. Engr. (Kyushu U.). Fluidization, Powder technology, Reaction engineering.

Associate Professors

Eugene V. Cilento, Ph.D. (U. Cincinnati). Physiological transport phenomena, Biomedical engineering.

Dady B. Dadyburjor, Ph.D. (U. Del.). Catalysis, Reaction engineering, Micellization.

Joseph A. Shaeiwitz, Ph.D. (Carnegie-Mellon U.). Biochemical separations, Interfacial phenomena, Mass transfer.

Alfred H. Stiller, Ph.D. (U. Cincinnati). Chemistry (physical inorganic chemistry), Solution chemistry, Coal liquefaction.

Ray Y. K. Yang, Ph.D. (Princeton U.). Chemical reaction engineering, Biochemical engineering, Modeling and simulation.

Assistant Professors

Charles W. White, Ph.D. (U. Penn). Computer-aided process design, Applied mathematics, Numerical methods.

Wallace B. Whiting, Ph.D. (U. Calif.—Berkeley). Thermodynamics, Fluid-phase equilibria, Chemical process design.

John W. Zondlo, Ph.D. (Carnegie-Mellon U.). Heat transfer, Fluid mechanics, Physical adsorption of gases.

Civil Engineering

Professors

Lyle K. Moulton, Ph.D. (WVU)—*Chair.* Soil properties and behavior, Groundwater and seepage, Foundation engineering.

Fred W. Beaufait, Ph.D. (VPI&SU). Structural analysis, Reinforced concrete.

Samuel G. Bonasso, M.S.C.E. (WVU)—*Adjunct.* Cable transportation, Street engineering, Communication and creativity in engineering.

Edmond B. Collins, M.S.Ag.E. (WVU). Agriculture and forestry in community development.

Ronald W. Eck, Ph.D. (Clemson U.). Transportation engineering, Traffic, Highways.

James L. Green, P.E., M.S.C.E. (WVU). Environmental engineering, Water treatment, Water quality.

W. Joseph Head, Ph.D. (Purdue U.). Waste utilization, Highway and airfield pavements, Concrete.

GangaRao V. S. Hota, Ph.D. (N.C. St. U.). Mathematical modeling of engineering systems, Bridge engineering, Prefabricated housing.

Charles R. Jenkins, Ph.D. (Okla. St. U.). Water quality, Water treatment, Wastewater treatment.

Larry D. Luttrell, Ph.D. (Cornell U.). Analysis and design of structures: steel, composite slabs, Metal buildings, Case studies of failures.

Edward S. Neumann, Ph.D. (Northwestern U.). Transportation engineering and planning, Automated people movers.

William A. Sack, Ph.D. (Mich. St. U.). Physical, chemical and biological waste treatment, Industrial waste processing and recovery.

Arthur W. Selders, P.E., M.S.Ag.E. (U. Mass.)—*Adjunct.* Agriculture and forestry extension services.

Associate Professors

Dennis C. Chambers, P.E., M.S.C.E. (WVU)—*Adjunct.* Geotechnical engineering, Construction and materials.

Darrell R. Dean, Jr., Ph.D. (Purdue U.). Land surveying, Mapping, Photogrammetry.

Robert N. Eli, Ph.D. (U. Iowa). Hydrology, Hydraulics, Computer graphics.

Donald D. Gray, Ph.D. (Purdue U.). Fluid flow, Computational fluid mechanics.

Grant T. Halvorsen, Ph.D. (U. Ill.). Structural engineering, Behavior and design of reinforced concrete structures, Performance of structures.

Michael McCawley, M.S.C.E. (WVU)—*Adjunct.* Environmental engineering, Air pollution, Air quality.

Ernest S. Moyer, Ph.D. (WVU)—*Adjunct.* Environmental, Aerosols, Organic vapors.

Robert B. Scott, M.S. (Davis & Elkins C.)—*Adjunct.* Environmental engineering, Water resources.

H. Jayalath Siriwardane, Ph.D. (VPI&SU). Geotechnical engineering/geomechanics, Finite element method, Computer applications.

Mumtaz A. Usmen, Ph.D. (WVU). Soils and foundations, Highway materials, Waste disposal and utilization.

Robert W. Wheeler, M.S.C.E. (WVU)—*Adjunct.* Environmental engineering, Public health, Water supply.

William D. Wyant, M.S.C.E. (WVU)—*Adjunct.* Transportation engineering, Construction methods.

Assistant Professors

John J. Bowders, Jr., Ph.D. (U. Tex.—Austin). Geotechnical aspects of hazardous waste disposal, Geophysical exploration.

James S. Gidley, Ph.D. (Harvard U.). Water resources planning, Solid and hazardous wastes, Water and sewer systems.

William J. Sproule, Ph.D. (Mich. St. U.). Airport planning and design, Public transportation, Transportation planning.

Constantine C. Spyrakos, Ph.D. (U. Minn.). Dynamics of structures, Soil-structure interaction, Numerical methods of analysis (BEM, FEM).

Electrical Engineering

Professors

Walton W. Cannon, Ph.D. (U. Ill.)—*Emeritus.*

Wils L. Cooley, Ph.D. (Carnegie-Mellon U.)—*Associate Chair.* Biomedical engineering, Electronics, Design.

Glafkos D. Galanos, Ph.D. (U. Manchester). Power system control, Transmission, Simulation.

Ronald L. Klein, Ph.D. (U. Iowa)—*Chair.* Automatic control, Estimation theory, System identification.

Wasfy B. Mikhael, Ph.D. (Concordia U.). Signal processing, Communication systems, Computer-aided design.

Roy S. Nutter, Jr., Ph.D. (WVU)—*Assistant Chair.* Expert systems, Microprocessor systems, Computer architecture.

Craig S. Sims, Ph.D. (SMU), Signal processing, Control systems, Estimation theory.

Nelson S. Smith, Jr., D.Sc. (U. Pitt). Physical electronics, Solid-state devices, Electronics.

Robert E. Swartwout, Ph.D. (U. Ill.). Digital systems, Computer arithmetic, Multivalued logic.

Associate Professors

Mohammad A. Choudhry, Ph.D. (Purdue U.). Power system control, DC transmission, Stability.

James F. Corum, Ph.D. (Ohio St. U.). Field theory, Radio astronomy, Microwave communications.

Everette C. Dubbe, B.S.E.E. (S. Dak. St. U.)—*Emeritus.*

Mark A. Jerabek, Ph.D. (Purdue U.). Acoustics, Ultrasonic tomography, Electromagnetics.

Joseph Joseph, Ph.D. (Indian Inst. Sci.). Artificial intelligence, Computer architecture, Data flow systems.

Robert L. McConnell, Ph.D. (U. Ky.). Electronic instrumentation, Power control, Design.

Assistant Professors

Charles J. Alajajian, Ph.D. (U. Ill.). Computer-aided design, Filter design, Digital signal processing.

Ali Feliachi, Ph.D. (Ga. Tech.). Large-scale systems, Adaptive control, Power systems.

Alok Kumar, Ph.D. (U. Leeds). Large-scale systems, Estimation theory, Two-dimensional digital signal processing.

Nigel T. Middleton, Ph.D. (U. Witwatersrand). Stochastic control, Industrial process control, Energy management systems.

Industrial Engineering

Professors

Jack Byrd, Jr., Ph.D. (WVU)—*Chair*. Operations research, Production systems, Entrepreneurial studies.

James O. H. Denny, M.L. (U. Pitt)—*Emeritus*.

Robert D. Fowler, M.S.I.E. (Ga. Tech). Work measurement, Materials handling, Human factors.

Ralph W. Plummer, Ph.D. (WVU). Human factors, System safety, Industrial hygiene.

Curtis J. Tompkins, Ph.D. (Ga. Tech)—*Dean*. Operations management, Statistical modeling, Strategic planning.

Associate Professors

Robert C. Creese, Ph.D. (Penn St. U.). Manufacturing processes/systems, Foundry engineering, Cost engineering.

Wafik H. Iskander, Ph.D. (Tex. Tech U.). Operations research, Simulation, Applied statistics.

L. Ted Moore, Ph.D. (Rice U.). Operations research, Linear programming, Production/operations management.

Terry L. Stobbe, Ph.D. (U. Mich.). Ergonomics, System safety, Industrial hygiene.

Richard E. Ward, Ph.D. (WVU). Production systems, Facilities/material handling systems design, Simulation materials handling.

Assistant Professors

Robert E. Glenn, M.P.H. (U. Minn.)—*Adjunct*. Health and safety.

John T. Jankovic, M.S.P.H. (U. N.C.)—*Adjunct*. Health and safety.

Majid Jaraiedi, Ph.D. (U. Mich.). Quality control and applied statistics, Information systems, Human factors.

William G. Jones, M.S. (Cen. Mo. St. U.)—*Adjunct*. Health and safety.

German Nunez, Ph.D. (Tex. A&M U.). Engineering management, Innovation management, Work analysis.

Penn A. Peters, M.S.E. (U. Wash.)—*Adjunct*. Forest systems.

Wayne T. Sanderson, M.S. (Cen. Mo. St. U.)—*Adjunct*. Health and safety.

Mechanical and Aerospace Engineering

Professors

Rodney Anderson, Ph.D. (U. Mo.—Rolla)—*Adjunct*. Aerosol and particle science.

Chester A. Arents, P.E., M.E. (U. Ore.)—*Emeritus*.

Richard A. Bajura, P.E., Ph.D. (U. N. Dame). Fluids engineering.

Paul J. Bekowies, Ph.D. (Cornell U.)—*Adjunct*. Coal science, Information systems.

Edward F. Byars, P.E., Ph.D. (U. Ill.)—*Emeritus*.

Carl H. Cather, P.E., M.S.M.E. (U. Ill.)—*Emeritus*.

James Condon, Ph.D. (Purdue U.)—*Adjunct*. Fluids engineering, Aerospace systems.

Jerome B. Fanucci, Ph.D. (Penn St. U.). Fluid dynamics, Aerodynamics, Flight testing.

Hasan T. Gencsoy, M.S.M.E. (WVU)—*Emeritus*.

Russell R. Haynes, P.E., Ph.D. (WVU)—*Adjunct*. Engineering design.

Eric K. Johnson, P.E., Ph.D. (U. Wisc.). Heat transfer, Combustion, Thermodynamics.

Thomas R. Long, Ed.D. (WVU). Engineering design.

John L. Loth, P.E., Ph.D. (U. Toronto). Aerospace systems, Combustion.

Donald W. Lyons, Ph.D. (Ga. Tech)—*Chair*. Manufacturing systems engineering, Instrumentation.

In-Meei Neou, Ph.D. (Stanford U.)—*Emeritus.*
Nathan Ness, Ph.D. (Poly. Inst. NY)—*Emeritus.*
Augustine A. Pitrolo, B.S.M.E. (WVU)—*Adjunct.* Fossil energy.
Helen L. Plants, P.E., M.S.C.E. (WVU)—*Emerita.*
Robert D. Slonneger, P.E., M.S.M.E. (U. Tex.). Thermodynamics, Computer applications.
John E. Sneckenberger, P.E., Ph.D. (WVU). Mechanical design and automation.
William Squire, M.A. (U. Buffalo). Fluid mechanics, Numerical methods.
Emil J. Steinhardt, P.E., Ph.D. (U. Pitt)—*Associate Chair.* Engineering systems design, Energy management.
Richard E. Walters, Ph.D. (WVU). Aerospace engineering.
Donald T. Worrell, P.E., M.S.E. (WVU)—*Emeritus.*

Associate Professors

Ismail Celik, Ph.D. (U. Iowa)—*Research.* Fluids engineering.
Russell K. Dean, Ph.D. (WVU). Engineering mechanics.
David G. Frazer, Ph.D. (Penn St. U.)—*Adjunct.*
John T. Jurewicz, Ph.D. (Wash. St. U.). Experimental fluid mechanics, Gas-solid.
John Kuhlman, Ph.D. (Case West. Res. U.)—*Visiting.* Fluid mechanics.
Kenneth H. Means, P.E., Ph.D. (WVU). Kinematics, Dynamics and stability, Friction and wear.
John Moran, B.S. (IIT)—*Adjunct.* Mechanical design.
John E. Notestein, M.S.M.E. (Purdue U.)—*Adjunct.* Fossil energy.
G. Michael Palmer, Ph.D. (WVU). Instrumentation, Microprocessor applications.
Larry D. Strickland, Ph.D. (WVU)—*Adjunct.* Fossil energy.
Wallace S. Venable, P.E., Ed.D. (WVU). Engineering mechanics.

Assistant Professors

John R. Etherton, M.S. (Geo. Wash. U.)—*Adjunct.* Mechanical system safety.
Sunil Kale, Ph.D. (Stanford U.)—*Research.* Fluid mechanics, Energy conversion, Thermal sciences.
George Kirby, Ph.D. (VPI&SU). Engineering structures.
Kwi Y. Lee, Ph.D. (U. Calif.—Berkeley). Heat and mass transfer, Combustion.
Victor Mucino, D.E. (U. Wisc.—Mil.)—*Visiting.* Engineering design.
Jacky Prucz, Ph.D. (Ga. Tech.). Structural dynamics, Composite materials, Experimental mechanics.
Nithiam T. Sivaneri, Ph.D. (Stanford U.). Aerospace engineering.
James E. Smith, Ph.D. (WVU)—*Research.* Mechanical design.
Charles Stanley, P.E., Ph.D. (WVU). Bioengineering, Microprocessor applications.
Kumar K. Tamma, Ph.D. (Old Dominion U.). Computer-aided design.

Freshman Program

Robert D. Slonneger, P.E., M.S.M.E. (U. Tex.), *Professor of Mechanical and Aerospace Engineering; Coordinator, Freshman Engineering Program.* Computers and thermodynamics.
Charles E. Wales, P.E., Ph.D. (Purdue U.), *Professor of Engineering and Education; Director, Center for Guided Design.* Decision-making, Guided design.

Admission

General requirements for admission to the College of Engineering are that all prospective students must be qualified for admission to WVU and present secondary school credits for 2 units of algebra, 1 unit of geometry, and ½ unit of trigonometry or advanced mathematics. Additional freshman-year admission requirements for West Virginia residents and out-of-state residents, plus special admission policies for transfer students, are noted below:

First-Year Students

All students are required to take the American College Testing Program (ACT) tests or the Scholastic Aptitude Test (SAT) and have the report of

scores sent to the WVU Office of Admissions and Records prior to the admission decision. Students admitted on the basis of SAT scores must submit results of the ACT by the end of the first semester of their freshman year.

West Virginia Residents: Admission to the College of Engineering will be granted based upon achievement of a high school grade-point average of 3.0 or better at graduation *and* a Standard ACT Mathematics score of 20 or higher, *or* a Standard ACT Mathematics score of 24 or higher.

Out-of-State Residents: The minimum conditions for admission to the College of Engineering is a Standard ACT Mathematics score of 28 or higher. Since there are a limited number of places in the College of Engineering for out-of-state residents, early application is strongly encouraged.

Admission to a Bachelor Degree Program

Students who are admitted to the College of Engineering at the beginning of their freshman year may seek admission to one of the bachelor degree programs in the College of Engineering at the beginning of the sophomore year. During the second semester of the freshman year, students will be given the opportunity to indicate their first, second, and third choice for the degree program they wish to enter. Admission will be made to programs as follows:

1. Students will be admitted to an engineering degree program at the end of the freshman year on the basis of grade points earned for the following courses: Math. 14, Math. 15, Math. 16, Chem. 15, Chem. 16, Engr. 1, Engr. 2, Phys. 11, and Engl. 1. Any student earning 80 grade points or more will automatically be admitted to the program of their choice.

2. Students not admitted to a program under Category 1 will be admitted to a specific program if they have met admission criteria and if space is available in the program.

Transfer Students

Students who wish to be considered for transfer admission to the College of Engineering from another WVU college or school, or an outside college or university, must satisfy both the WVU general admission requirements and as a *minimum:*

1. Have a grade-point average of 3.0 or higher for all college-level work attempted.

2. Have completed Math. 15 and 16 and Chem. 15 and 16 or Physics 11 and 12 (or their equivalents) with an average of 2.5 or better in each of the mathematics, and chemistry or physics areas.

Students not meeting these minimum transfer requirements, but who display special aptitude for engineering studies, may request to be admitted to the College of Engineering by written petition to the Assistant Dean for Academic Affairs.

Engineering courses will be open only to students formally admitted to the College of Engineering and those students in other colleges and schools which specify engineering courses as curriculum requirements—provided, in each case, that the students have the specified prerequisite or corequisite subjects. In no instance will students in General Studies—or other programs at WVU—who wish to transfer to the College of Engineering be permitted to enroll in engineering courses prior to being officially accepted as an engineering major.

Applications for transfer student admission to undergraduate programs in the College of Engineering must be received according to the schedule below:

Desired Date of Entry:	*Deadline Date for Receipt of Application:*
Summer Session or First Semester	Preceding March 15
Second Semester	Preceding November 1

The number of transfer students accepted into the College of Engineering will be governed by the enrollment capacities of each of the six undergraduate engineering programs. First admission priority will be granted to those students currently matriculated at WVU and in pre-engineering programs which meet the articulation agreement (Board of Regents Administration Bulletin No. 23) at state colleges and universities within West Virginia; second priority to students enrolled in pre-engineering type programs at non-state institutions; and third priority to students in non-engineering curricula at external colleges and universities. Within the three categories cited above, preferential admission will be in the following order: West Virginia residents, non-West Virginia U.S. residents, and foreign students.

Complete information concerning WVU admission, fees, and expenses is in Part 2 of the *Undergraduate Catalog*. Academic information is in Part 3.

Requirements for Degrees

To be eligible to receive a bachelor's degree in any branch of engineering for which degrees are offered, a student must be admitted to the College, satisfactorily complete the number of semester hours of work as specified in the curriculum of the department leading to the degree for which the student is a candidate, and satisfy any special proficiency requirements stated by the department.

In order to receive a degree in the College of Engineering, a student must be registered in his or her major department during the final semester in residence. In the case of dual degrees, completion out of residence, or other exceptions, arrangements must be made with the chairperson of the major department at least four months before the expected graduation date.

Credit Hour Limitation

The maximum student credit load is 20 hours per semester without prior approval of the Committee on Academic Standards.

College of Engineering Curricula

During the first two years the curricula provide a well-rounded training in English and the basic sciences of mathematics, chemistry, and physics. This is accompanied by courses stressing fundamental engineering concepts, skills, and methodology, plus introductory courses in the major field. A student does not have to definitively select a major program of study until the beginning of the second year.

In the third and fourth years, special emphasis is placed on the professional work of the engineer. In these years a certain number of credit hours are usually available for technical and professional electives.

Courses in the humanities and social sciences are taken throughout the four years.

The curricula lead to:

1. The degree of Bachelor of Science in Aerospace Engineering.
2. The degree of Bachelor of Science in Chemical Engineering.
3. The degree of Bachelor of Science in Civil Engineering.
4. The degree of Bachelor of Science in Electrical Engineering.
5. The degree of Bachelor of Science in Industrial Engineering.
6. The degree of Bachelor of Science in Mechanical Engineering.

Common First-Year Engineering Curriculum

Students who entered the College of Engineering beginning the First Semester, 1984-85, and later, are admitted to the College of Engineering and not to a department or program. They will follow the first-year curriculum:

FIRST-YEAR CURRICULUM

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Chem. 15	4	Chem. 16	4
Math. 15	4	Math. 16	4
Engr. 1	3	Engr. 2	3
Engl. 1	3	Physics 11	4
Non-tech. elect.[1]	3	Non-tech. elect.	3
	17		18

[1]Non-technical elective Core Curriculum courses must consist of 12 hours of Group A, 12 hours of Group B, and at least two different subjects in each group; 18 hours must be Core Courses from the College of Engineering ABET socio-humanistic list.

Curriculum in Aerospace Engineering

Degree: Bachelor of Science in Aerospace Engineering

Aerospace travel, space exploration, and flight of manned or unmanned vehicles continue to gain significance in modern activities. Aerospace Engineering is involved with the science and technology of advanced vehicles, including aircraft, rockets, missiles and spacecraft. Although a special branch of engineering, it is also diverse. Aerospace technology has expanded to include design and development of new earthbound vehicles such as ground effect machines, hydrofoil ships and high speed rail-type systems. Wind engineering and wind energy conversion are also current topics of study.

The Aerospace Engineering program at WVU is designed to prepare the student for a career in the aerospace industries and in government research and development centers and laboratories, as well as in military mission-oriented agencies. The undergraduate curriculum also allows the student to prepare for graduate studies in aerospace engineering science and in other engineering and nonengineering fields.

The aerospace engineering curriculum includes studies in the disciplines encountered in the design of aerospace vehicles, missiles, rockets, and spacecraft. The undergraduate student studies extensively the basic principles of fluid dynamics, solid mechanics and structures, stability and control, and thermal sciences and propulsion. The student is involved in both theoretical and experimental studies, and trained to integrate knowledge with practical engineering design. With the breadth and depth of education in aerospace engineering, the student becomes a versatile engineer, competent to work in many areas. The curriculum may serve as a terminal program by incorporating

design-oriented courses for technical electives, or it may be used as a preparatory program for advanced study by the selection of science-oriented courses.

A blend of theoretical and experimental expertise within the faculty exposes students to real-world problems. Recent projects, such as design, construction, and testing of an STOL (short-takeoff-and-landing distance) aircraft and several wind turbines, illustrate this point.

For those students who wish to pursue a career in medicine, dentistry, or related areas, but desire an aerospace engineering degree before entering the appropriate professional school, certain course substitutions may be made. These substitutions include biology (8 hours) and organic chemistry (8 hours) to be substituted for 9 hours of technical electives and 3 hours of heat transfer. All students must satisfy design course requirements as specified by the department. This selection will help the student satisfy admission requirements to the professional schools in the health sciences.

The aerospace engineering program at WVU is administered by the faculty of the Department of Mechanical and Aerospace Engineering.

Minimum Grade-Point Average Requirement for Graduation (B.S.A.E.)

A requirement for graduation in aerospace engineering is for the student to attain a departmental grade-point average of at least 2.0 in all required Mechanical and Aerospace Engineering departmental courses. If a required M.A.E. course is repeated, only the hours credited and the grade received for the last completion of the course will be counted in computing the student's departmental grade-point average.

AEROSPACE ENGINEERING

FIRST YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Math. 15	4	Math. 16	4
Engl. 1	3	Engr. 2	3
Engr. 1	3	Chem. 16	4
Chem. 15	4	Physics 11	4
Non-tech. elect.	3	Non-tech. elect.	3
	17		18

SECOND YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Math. 17	4	Math. 18	4
Phys. 12	4	M.A.E. 42	3
M.A.E. 12	3	M.A.E. 43	3
M.A.E. 41	3	M.A.E. 114	3
Engl. 2	3	Non-tech. elect.	3
	17		16

THIRD YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
M.A.E. 116	3	M.A.E. 104	3
M.A.E. 140	3	M.A.E. 117	3
M.A.E. 160	3	M.A.E. 146	4
E.E. 103	3	M.A.E. 161	3
E.E. 104	1	M.A.E. 165	2
Non-tech. elect.	3	Non-tech. elect.	3
	16		18

FOURTH YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
M.A.E. 100	Cr.	M.A.E. 120	3
M.A.E. 115	3	M.A.E. 158	3
M.A.E. 150	3	Technical elect.	6
M.A.E. 162	3	Non-tech. elect.	6
Technical elect.	3		
Non-tech. elect.	3		
	15		18

NOTES: Physics 11 may be delayed until the First Semester of the Second Year and replaced in the First Year with a Non-technical elective.

Non-technical elective Core Curriculum courses must consist of 12 hr. of Group A and 12 hr. of Group B, and at least two subjects in each group; 16 hr. must be Core courses on the College of Engineering-approved list.

Two technical electives (6 hr.) must be selected from the M.A.E.-approved list.

Curriculum in Chemical Engineering

Degree: Bachelor of Science in Chemical Engineering

The Chemical Engineering curriculum is designed to give the graduates a broad background in chemical engineering processes and prepare them to become professional engineers.

Students are prepared for positions in operation, development, design, construction, and management of industrial plants. These industries subject raw materials to chemical and physical changes and produce economically desirable products.

A comprehensive background in basic science, mathematics, and humanities courses is scheduled. Electives are available for specialization in fields such as polymers, nuclear energy, coal conversion, mathematical modeling, and separations. Practical work on design and synthesis is incorporated into all chemical engineering courses.

The senior courses introduce the student to the actual practice of chemical engineering. A comprehensive plant design project provides the core for the senior program. Throughout the year the class work emphasizes reactor design, process dynamics, design of experiments, and professional practice and ethics. Integrated into this program are oral and written technical communications.

To receive a degree of Bachelor of Science in Chemical Engineering, a student must take all of the courses indicated in the chemical engineering curriculum and must attain a grade-point average of 2.0 or better for all required chemical engineering courses. If a course is repeated, only the last grade received will be considered in computing this grade-point average. Chemical engineering courses used to satisfy technical or engineering science electives will not be considered in the grade-point average. This requirement helps assure that the student has demonstrated overall competence in the chosen major.

CHEMICAL ENGINEERING

FIRST YEAR				SECOND YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Math. 15	4	Math. 16	4	Math. 17	4	Math. 18	4
Chem. 15	4	Chem. 16	4	Chem. 133	3	Chem. 134	3
Engr. 1	3	Engr. 2	3	Chem. 135	1	Chem. 136	1
Engl. 1	3	Elect. (SS-Hum.)	3	Phys. 12	4	Ch.E. 38	3
Elect. (SS-Hum.)	3	Physics 11	4	Ch.E. 40	3	Ch.E. 41	3
				Engl. 2	3	Elect. (SS-Hum.)	3
	17		18		18		17

THIRD YEAR				FOURTH YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Chem. 246	3	Chem. 248	3	M.A.E. 41	3	M.A.E. 43	3
Ch.E. 110	3	Chem. 142	1	Ch.E. 170	3	Ch.E. 171	3
Ch.E. 111	3	Ch.E. 112	4	Ch.E. 172	3	Ch.E. 175	3
Ch.E. 142	4	Ch.E. 145	3	Ch.E. 180	1	Ch.E. 181	1
Electives	6	Electives	6	Ch.E. 190	1	Ch.E. 191	1
				Electives	6	Electives	6
	19		17		17		17

Lower-division ROTC can count toward Core B requirements but cannot count toward Core A.

Electives in junior and senior years must be selected to complete requirements of non-technical electives (24 hr.), a technical elective (3 hr.), an Engineering Science elective (3 hr.), and an advanced Chemistry elective (3 hr.). All electives must be selected from a list of electives approved by the Department of Chemical Engineering.

A 2.0 grade-point average in required chemical engineering courses is necessary before a student can register in Ch.E. 110, 111, 142, 170, or 172.

Curriculum in Civil Engineering

Degree: Bachelor of Science in Civil Engineering

The primary emphasis of the undergraduate program in Civil Engineering is to educate a professional engineer who will be expected to assume the role of problem solver, decision maker, and technical leader, and one whose education background will undergird the continuing development required for practice during a forty-year career.

During the four-year program, civil engineering students are given a solid grounding in mathematics, physics, and chemistry to enable them to understand the fundamental principles of engineering. Added to this is extensive development of the fundamentals of environment, soils, and materials, structural, and transportation systems engineering. To help the student to understand one's role in the community, to be effective in working in design teams involving other engineers and other professions, to be effective in leadership and decision making and to be effective as a spokesperson, the curriculum attempts to give the student a meaningful educational experience in the humanities, English, and economics. Some specialization is available through electives in advanced courses in transportation, sanitary engineering, structures, soil mechanics, or photogrammetry and surveying, which are available in civil engineering or related departments.

To be eligible for graduation in civil engineering, a student must attain a grade-point average of 2.0 or better for all civil engineering courses attempted, except for those courses in which a grade of W or WU was received. If a course is repeated only the last grade received will be counted in computing the

CIVIL ENGINEERING

FIRST YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Math. 15	4	Math. 16	4
Engl. 1	3	Engr. 2	3
Engr. 1	3	Chem. 16	4
Chem. 15	4	Physics 11*	4
Non-tech. elect.	3	Non-tech. elect.	3
	17		18

SECOND YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Math. 17	4	Math. 18	4
Phys. 12	4	M.A.E. 42	3
M.A.E. 41	3	M.A.E. 43	3
Geol. 1	3	C.E. 101	4
Engl. 2	3	Non-tech. elect.	3
	17		17

THIRD YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
C.E. 110	4	C.E. 132	4
C.E. 120	4	C.E. 146	3
C.E. 160	3	C.E. 181	3
C.E. 195	Cr	C.E. 195	Cr
Engl. 208	3	C.E. 260	3
Eng. Sci. elect.	3	I.E. 277	3
		Non-tech. elect.	3
	17		19

FOURTH YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
C.E. 147	3	C.E. elect.	3
C.E. 281	3	C.E. 196	1
C.E. 196	1	C.E. 271 (or C.E. 270)	3
C.E. 270 (or C.E. 271)	3	Math/Sci elect.	3
C.E. elect.	6	Non-tech. elect.	6
Non-tech. elect.	3		
	19		16

*Physics 11 may be delayed until the sophomore year. In its place select a course from Core Group A or B.

1. Civil Engineering electives must be 200-level Civil Engineering courses.

2. Engineering Science electives are to be selected from C.E. 240, E.E. 101, M.A.E. 200, 204, 222, and either M.A.E. 101 or 104.

3. Mathematics/Science electives can be any engineering science elective, or any of the following: Ag. Micro. 141; Biol. 246; Ag. Bi. 210; Chem. 115, 131, 141; Geol. 151, 184, 221, 222; Math. 113, 241, 256, 291; I.E. 113, 281; Stat. 101.

4. Nine hours of non-technical electives must be selected from two subjects in Group A and 12 hours from two subjects in Group B. Each student shall select this sequence of courses with the cooperation and approval of the adviser to constitute a meaningful program of study in keeping with the student's interests and career goals. A listing of sample course sequences can be obtained from advisers. All non-technical electives must meet University Core Curriculum requirements and College of Engineering humanistic course requirements.

grade-point average; when a course is repeated, the course credit hours will be counted only once. This requirement assures that the student has demonstrated overall competence in the chosen major.

Curriculum in Electrical Engineering

Degree: Bachelor of Science In Electrical Engineering

The curriculum in Electrical Engineering has been developed to give the student general training in the field of electrical engineering. Some special training is available in the following fields as electives in the senior year: electric power, communications, control, solid state electronics, microwaves, antennas, and computing systems.

In the first two years of electrical engineering, work is limited to those subjects which are essential as preparatory courses for more technical courses in the third and fourth years. Fundamental courses in electrical engineering are introduced during the second year. In the third and fourth years the curriculum is mainly courses in electrical engineering and electives.

Technical electives are scheduled in the curriculum to permit a student to acquire more depth in the student's preferred area of electrical engineering. Thus, electives normally will be selected from 200-level electrical engineering courses. However, the student's adviser may recommend, in some cases, that a student select technical electives from upper-level courses in mathematics, the sciences, or other areas of engineering as a part of the curriculum. The

ELECTRICAL ENGINEERING

FIRST YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Chem. 15	4	Chem. 16	4
Engr. 1	3	Engr. 2	3
Engl. 1	3	Math. 16	4
Math. 15	4	Physics 11	4
Non-tech. elect.	3	Non-tech. elect.	3
	17		18

SECOND YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
E.E. 21	3	E.E. 24	3
E.E. 22	1	E.E. 25	1
E.E. 71	3	Math. 18	4
Math. 17	4	Engl. 2	3
Phys. 12	4	M.A.E. 42	3
M.A.E. 41	3	Tech. elect. or Non-tech. elect.	3
	18		17

THIRD YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
E.E. 124	3	E.E. 126	3
E.E. 127	1	E.E. 130	3
E.E. 140	3	E.E. 135	1
E.E. 151	4	E.E. 141	3
Math. or Stat. elect.	3	E.E. 156 & 157 (or 158 & 159)	2+1 (3+1)
Non-tech. elect.	3	Non-tech. elect.	3
	17		16 (17)

FOURTH YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Econ. 54	3	Econ. 55	3
E.E. 131	3	E.E. 181	3
E.E. 136	1	Non-tech. elect.	3
E.E. 158 & 159 (or E.E. 156 & 157)	3+1 (2+1)	Tech. elect.	3
E.E. 180	1	Tech. elect.	3
Non tech. elect. or Tech. elect.	3		
Tech. elect.	3		
	18 (17)		15

A total of six non-technical electives and four technical electives must be selected. The non-technical electives must be chosen so as to meet the Core Requirements of WVU and the ABET guidelines.

mathematics elective is to be selected from a department-approved list. Students should consult with their advisers to select a course from this list.

Students enrolled in the Department of Electrical Engineering will not be permitted to register for any electrical engineering courses until they have attained a grade of C or better in each of the electrical engineering courses which are prerequisite to that course. This rule is intended to insure that the student has mastered prerequisite material before advancing to more difficult material.

To be eligible for graduation in electrical engineering a student must attain a grade-point average of 2.0 or better for all electrical engineering courses attempted except for those courses in which a grade of W or WU was received. This rule serves the purpose of assuring that the student has demonstrated overall competence in the chosen major.

Curriculum in Industrial Engineering

Degree: Bachelor of Science in Industrial Engineering

Industrial Engineering began in the latter part of the nineteenth century through the efforts of such pioneers as Frederick Taylor and Frank and Lillian Gilbreth. The Gilbreths are best known as leading figures in the book and movie entitled *Cheaper by the Dozen*. These early industrial engineers were concerned with improving the effectiveness of manual industrial operations. They made remarkable savings possible through the use of motion and time studies and methods analysis. As industries became more complex, large scale systems, industrial engineers became concerned with additional areas of management. Industrial engineers became involved in the design of production facilities using plant layout procedures. They also were developing quality control plans which are so important today in providing for consumer protection in product purchases. As production processes became more complex, the industrial engineer became involved in examining the range of manufacturing processes necessary to produce a product and how these can be utilized most effectively. In the late fifties and in the early sixties, the computer became a powerful new tool for use in solving management problems. Once the computer became economical, the industrial engineer became involved in using the computer to solve larger and more complex management problems through the use of such modern management science tools as operations research.

Today's students learn the fundamental principles which were developed years ago; however, the industrial engineering student of the eighties is increasingly more concerned with using the computer to solve industrial and social problems. At the same time, the industrial engineer has become even more involved with the human element of the organization. The industrial engineering area known as human factors is concerned with the individual's health, safety limitations, and capabilities as they relate to the job and the working environment.

The graduating industrial engineer has a versatile degree which can be used in every endeavor of society. Since the industrial engineer is involved in more effective management of organizations, the industrial engineer is not limited to any one industry. Many have found employment in such places as hospitals, banks, retail stores, and virtually every governmental agency. Industries have found that their managers must have knowledge of both technical and management problems. The industrial engineer has an excellent

blending of these two fields—technology and management. The top management of many of our largest organizations are industrial engineers.

The industrial engineering program at WVU devotes considerable attention to the individual needs of the student. The faculty works extensively with students in such areas as communication skills, personal growth and development, and the creation of summer job opportunities. The goal of the department is to develop student strengths in technical abilities, personal development, general education, and practical experience.

Students majoring in Industrial Engineering must achieve a minimum cumulative grade-point average of at least 2.25 in all departmental major area courses as a requirement for graduation.

INDUSTRIAL ENGINEERING

FIRST YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Math. 15	4	Math. 16	4
Engl. 1	3	Engr. 2	3
Engr. 1	3	Chem. 16	4
Chem. 15	4	Non-tech. elect.	3
Non-tech. elect.	3	Physics 11	4
	17		18

SECOND YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Math. 17	4	Math. 18	4
Phys. 12	4	M.A.E. 43	3
M.A.E. 41	3	I.E. 170	3
Engl. 2	3	I.E. 113	3
I.E. 20	1		
I.E. 140	3		
	18		16

THIRD YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Econ. 54	3	Econ. 55	3
I.E. 214	3	I.E. 242	3
M.A.E. 42	3	I.E. 250	3
Ch.E. 105	3	I.E. 260	3
I.E. 281	3	I.E. 100	3
I.E. 277	3	Non-tech. elect.	3
	18		18

FOURTH YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
I.E. 291	3	M.A.E. 101	3
I.E. tech. elect.	3	I.E. 292	3
E.E. 101	3	I.E. tech. elect.	6
E.E. 102	1	M.A.E. 114	3
Non-tech. elect.	6		
	16		15

Non-technical electives must satisfy requirements in both Group A and B Core Curriculum requirements.

Note: All students in industrial engineering must take the Engineer-in-Training (EIT) examination before graduation.

Curriculum in Mechanical Engineering

Degree: Bachelor of Science in Mechanical Engineering

Mechanical Engineering is a broad technical discipline. It integrates knowledge of the physical sciences and mathematics for the design, construction and manufacture, testing, analysis, use and operation of a device, a structure, a machine, a process or a system in service to mankind. Its development parallels the growth of industry. Modern society needs mechanical engineers who have broad and deep training in the fundamentals of engineering and related sciences, and have developed a versatility in analyzing and solving complex problems. The mechanical engineer must not only possess a high level of professional expertise but also have an appreciation for vital human and economic considerations.

Mechanical engineers are problem solvers who are scientifically informed and mathematically minded. Graduates of the mechanical engineering curriculum find employment in a wide range of industries, government agencies,

and educational institutions where they are concerned with: the use and economic conversion of energy from natural sources into useful energy for power, light, heating, cooling, and transportation; the design and production of machines to lighten the burden of human work; the planning and development of systems for using energy machines and resources; the processing of materials into products useful to mankind; and the education and training of specialists who deal with mechanical systems.

The mechanical engineering curriculum prepares students to deal effectively with a broad range of engineering problems rather than narrow specialties.

While the undergraduate curriculum is sufficiently broad to permit the graduate to select from a wide variety of employment opportunities, it contains sufficient depth to prepare a student to enter a graduate school to pursue an advanced degree. As modern science and engineering become more complex, the desirability of graduate-level preparation is being recognized by most advanced industries and government agencies.

A requirement for graduation in mechanical engineering is for a student to attain a departmental grade-point average of 2.0 or better for all required Mechanical and Aerospace Engineering courses. If a required M.A.E. course is repeated, only the hours credited and the grade received for the last completion of the course will be used in computing the grade-point average.

MECHANICAL ENGINEERING

FIRST YEAR				**SECOND YEAR**			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Engr. 1	3	Engr. 2	3	M.A.E. 32	3	M.A.E. 42	3
Math. 15	4	Math. 16	4	M.A.E. 41	3	M.A.E. 43	3
Chem. 15	4	Chem. 16	4	Math. 17	4	M.A.E. 140	3
Engl. 1	3	Phys. 11*	4	Phys. 12	4	M.A.E. 171	3
Core	3	Core	3	Engl. 2	3	Math. 18	4
						M.A.E. 53	1
	17		18		17		17

THIRD YEAR				**FOURTH YEAR**			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
M.A.E 113	3	M.A.E. 132	3	M.A.E. 135	3	M.A.E. 184	3
M.A.E. 141	3	M.A.E. 158	3	M.A.E. 183	3	Prof. elect.	3
M.A.E. 144	3	M.A.E. 181	3	M.A.E. 122	3	E.E. 103	3
M.A.E. 145	1	I.E. 100	3	Prof. elect.	3	E.E. 104	1
E.E. 101	3	Core	3	Core	3	Core	3
E.E. 102	1	Core	3	Core	3	Core	3
Ch.E. 105	3						
	17		18		18		16

*Physics 11 may be delayed until the sophomore year. In its place select a course from Core Group A or B.

The professional electives (6 hr.) are selected by the student with the advice and approval of the adviser. The course selected should form a clear and consistent pattern according to the career objectives of the student. The professional elective credits must be selected from courses in the department.

Non-technical elective Core Curriculum courses must consist of 12 hr. of Group A and 12 hr. of Group B, and at least two subjects in each group; 16 hr. must be core courses on the College of Engineering-approved list.

College of Engineering
Undergraduate Core Curriculum Requirements

All engineering undergraduate students must satisfy the WVU Core requirements. They must also satisfy the College of Engineering Core requirements, which encompass the University rules. The following are these requirements:

1. Each student must take 12 credits of University-approved Core A courses and 12 credits of University-approved Core B courses.

2. Sixteen of this total of 24 credits must be from the College of Engineering approved Core List.

3. The 12-credit hours must include courses taken in at least two departments. Two 4-credit courses and one 3-credit course may be substituted in lieu of 12 credit hours.

4. Advanced Air Force ROTC students may substitute AFROTC 105 and 106 for Psych. 1 and 164, respectively. They may also substitute both AFROTC 107 and 108 for a total of 3 hours of approved Political Science. This statement pertains to Air Force ROTC only. No equivalent agreement exists with the Army ROTC.

5. Freshman and sophomore ROTC courses can be counted as Core A or B, preferably B. They are *not* approved College of Engineering Core and thus cannot count toward fulfilling the 16 hours to be chosen from the approved College of Engineering list. However, they may be counted as part of the 8 hours of Core that do not have to be chosen from the approved College of Engineering list.

6. There are several University-approved Core courses which have not been listed as College of Engineering approved Core courses. If students from other colleges or schools who have taken these courses transfer into the College of Engineering, these courses may be considered by the departments and the Provost for Academic Affairs for inclusion as College of Engineering approved Core courses on a case-by-case basis.

7. Courses listed as independent study or special topics (i.e., those courses for which a full course description is not given) are not listed as College of Engineering approved core courses. These courses will also be considered by the departments and the Provost for Academic Affairs for inclusion as College of Engineering approved Core courses on a case-by-case basis.

Please note that not all courses in Humanities and Social Sciences departments are included in the University-approved core list.

College of Engineering Approved Core Course List

Core A

Art 30, 105, 106.

English 21-22, 24-25, 35-36, 40, 45, 80, 85, 101-104, 106, 111-113, 125, 130-134, 141, 143, 145, 150, 170-172, 175, 178, 180-181, 183, 186, 188, 197, 201-202, 210-211, 220, 223, 232-233, 235-236, 240-241, 245, 250, 255-256, 261-268, 280, 283, 288.

Foreign Languages:

Classics 1-2,* 3-4, 11-12,** 13-14, 101-102, 109-110, 113, 165.

FLIT 111-112, 121-122, 131-132, 141-142, 151-152, 155, 161-162, 171, 181-182, 191-192.

French 1-2,* 3-4, 10, 11, 23-24, 33-34, 101-104, 109-112, 115, 118.

*These are approved Core A only if both 1 and 2 are taken.
**These are approved Core A only if both 3 and 4 are taken.

German 1-2,* 3-4, 10, 11, 23-24, 33-34, 103-104, 121-122, 131.
Hebrew 1-2,* 3-4.
Italian 1-2,* 3-4, 109-110.
Linguistics 1-3, 111.
Polish 1-2.
Portuguese 1-2,* 3-4.
Russian 1-2,* 3-4, 103-106, 109-110, 144-145.
Spanish 1-2,* 3-4, 10, 11, 23-24, 33-34, 103-104, 109-110, 116-118, 121-122.
Humanities 1-5, 10-11.
Multidisciplinary Studies 40, 90-92.
Music 30-31, 33-34, 129-130, 135-138, 230.
Philosophy 1-5, 10, 13, 15, 17, 20, 103, 105, 108, 111, 113, 120-123, 150, 158-159, 166, 171-172, 187, 253, 272, 283, 285.
Religious Studies 5-150.
Speech Communication 11-14, 21, 80, 106-109, 111, 131, 133, 180, 187, 206, 221, 230-231.
Theatre 30, 50, 74, 95, 106, 180, 220-221, 282, 290-291, 295-298.
Women's Studies 40.

*These are approved Core A only if both 1 and 2 are taken.

Core B

Child Development & Family Studies 10, 12, 110.
Economics 51, 54-55, 110, 130, 160, 200, 211-213, 216, 241, 245-246, 250, 255, 257, 262-263, 270.
Education Foundations 1.
Forestry 140.
Geography 1, 7-8, 105, 107, 109-110, 140-141, 143-145, 150, 200-202, 205, 209, 215, 235.
History 1-290.
Mineral Resource Economics 97.
Multidisciplinary Studies 2, 40, 50, 60, 70, 90-92, 250. (MDS 80 when offered as "Labor in America.")
Political Science* 1-160, 210-279.
Psychology 1**-2, 101, 131, 141, 151, 164***, 170-171, 218, 223-225, 232, 242-243, 245, 251, 262-264, 274, 279, 281-282.
Sociology and Anthropology 1, 5, 51, 102, 121-123, 125, 131-133, 135-136, 138, 140, 145, 151, 153, 156-158, 160, 201-202, 204-205, 222, 232-233, 240, 255, 260-262.
Technology Education 281.
Women's Studies 40.

*Both AFROTC 107 and 108 will substitute for a total of 3 hours of approved Political Science.
**AFROTC 105 will substitute for Psych. 1.
***AFROTC 106 will substitute for Psych. 164.

Courses of Instruction in Engineering

Engineering courses will be open only to students formally admitted to the College of Engineering and those students in other colleges and schools which specify engineering courses as curriculum requirements—provided, in each case, that the students have the specified prerequisite or corequisite subjects. In no instance will students in General Studies—or other programs at WVU—who wish to transfer to the College of Engineering be permitted to enroll in engineering courses prior to being officially accepted as an engineering major.

Freshman Program (Engr.)

1. *Freshman Engineering Design.* 3 hr. PR or Coreq.: Math. 14. Introduction to the concepts of design (analysis, synthesis, evaluation), report writing, conservation of energy, calculation techniques, and engineering sketching. 2 hr. lec., 3 hr. lab.

2. *Freshman Engineering Design and Analysis.* 3 hr. PR or Coreq: Math. 14 or consent. Introduction to engineering profession, engineering concepts, and BASIC and FORTRAN programming with emphasis on solutions to engineering problems.

General Engineering (Engr.)

111.* *Impact of Technology on Society.* 3 hr. Designed for non-technical students to give insight into the social relevance of technology and engineering in today's culture, this course deals with the broad interface of technology and modern society, with life essentials, communication, manufacturing, etc. Attitudes of scientists, engineers, and others are compared. *(Course will not be offered in 1986-87.)*

191. *Special Topics.* 1-6 hr. PR or Coreq.: Junior standing; consent. Special topics in fields of general engineering, engineering analysis and design, and engineering education. *(Course will not be offered in 1986-87.)*

260. *Assessment of Energy Systems.* 3 hr. A comparative study of energy systems for use in meeting the energy demands of the nation. Conversion processes for utilizing fossil fuel, nuclear, geothermal, and solar sources for supplying clean fuels and energy. *(Course will not be offered in 1986-87.)*

Chemical Engineering (Ch.E.)

38. *Numerical Methods for Chemical Engineering.* 3 hr. PR: Engr. 2, Math. 17; Coreq.: Ch.E. 41, Math. 18. Numerical solution of algebraic and differential equations with emphasis on process material and energy balances. Statistical methods, optimization, and numerical analysis. 4 hr. lec.

40. *Material and Energy Balances* 1. 3 hr. PR: Math. 15, Chem. 16. Coreq: Engr. 2. Introduction to chemical engineering fundamentals and calculation procedures, industrial stoichiometry, real gases and vapor-liquid equilibrium, heat capacities and enthalpies; material balances and energy balances. 2 hr. lec., 2 hr. calc. lab.

41. *Material and Energy Balances* 2. 3 hr. PR: Ch. E. 40. Coreq.: Ch.E. 38. Continuation of Ch.E. 40. 2 hr. lec., 2 hr. calc. lab.

105. *Engineering Materials Science.* 3 hr. PR: Phys. 12. Includes a study of the internal structures of metals, ceramics, and organic materials, and the dependence of properties upon these structures. Also, the behavior of materials under conditions involving mechanical stresses, thermal reactions, corrosion, electromagnetic fields, and radiation. 3 hr. lec.

110. *Single and Multi-Phase Fluid Flow.* 3 hr. PR: Math. 17, Ch.E. 41. Fluid statics, laminar and turbulent flow phenomena, fluid friction and flow in pipes, pumps, metering and transportation of fluids, single and multiple phase flow through packed beds, settling and filtration. Laboratory demonstrations and experiments. 2 hr. lec., 2 hr. lab.

111. *Process Heat Transfer.* 3 hr. PR: Math. 17, Ch.E. 41. Conductive heat transfer, convective heat transfer, design and selection of heat exchange equipment, evaporation, and radiation. Applications, laboratory demonstrations, and experiments. 2 hr. lec., 2 hr. lab.

112. *Separation Processes.* 4 hr. PR: Ch.E. 110, 111, 142. Equilibrium stage-multiple stage operations, differential counter current contacting, air-water contact operations, drying, selection of separation processes. Laboratory demonstrations and experiments. 3 hr. lec., 2 hr. lab.

*May be taken as undergraduate work by students in other colleges and schools.

142. *Chemical Engineering Thermodynamics.* 4 hr. PR: Ch.E. 41, Math. 17. First and second laws of thermodynamics. Thermodynamic functions for real materials. Physical and chemical equilibrium concepts and applications. 3 hr. lec., 2 hr. lab.

145. *Chemical Engineering Transport Analysis.* 3 hr. PR: Ch.E. 38, 110, 142, Math. 18. Development of fundamental relationships for momentum, heat and mass transfer for flow systems to include chemical reactions, interphase transport, and transient phenomena. Development and use of microscopic and macroscopic balance equations. 3 hr. lec.

170. *Chemical Plant Design 1.* 3 hr. PR: Ch.E. 112, 145. Analysis, synthesis, and design of chemical process units and systems. Professional aspects of the practice of chemical engineering. Includes a comprehensive chemical plant design project. 2 hr. lec., 4 hr. calc. lab.

171. *Chemical Plant Process Design 2.* 3 hr. PR: Ch. E. 170. Continuation of Ch.E. 170. 2 hr. lec., 4 hr. calc. lab.

172. *Chemical Reaction Engineering.* 3 hr. PR: Ch.E. 145. Application of material balances, energy balances, chemical equilibrium relations, and chemical kinetic expressions to the design of chemical reactors. 3 hr. lec., 2 hr. lab.

175. *Chemical Process Simulation.* 3 hr. PR: Ch.E. 112, 145. Transient behavior of chemical process flow systems, linearization and stability. Process control system design including frequency response analysis. Analog simulation of process dynamics. 3 hr. lec.

180. *Unit Operations Laboratory 1.* 1 hr. per sem. Conc.: Ch.E. 170. Operation of chemical process engineering equipment; collection, analysis, and evaluation of data; laboratory report preparation. 4 hr. lab.

181. *Unit Operations Laboratory 2.* 1 hr. per sem. PR: Ch.E. 180. Conc.: Ch.E. 171. Continuation of Ch.E. 180. 4 hr. lab.

190, 191. *Chemical Engineering Design Practicum.* 1 hr. per sem. Conc.: Ch.E. 170, 171. Practical application of process and equipment design methods of chemical engineering.

197. *Thesis.* 2-5 hr. Open only to qualified seniors. A problem in chemical engineering or industrial chemistry is selected for investigation. A carefully prepared report is required. 6-15 hr. lab.

224. *Process Development.* 3 hr. PR: Chem. 134, 144; Ch.E. 111, 145 or consent. Coal conversion process systems from the modified unit operations-unit process concept. Thermodynamics and kinetics in evaluation of system requirements and performance. 3 hr. lec. *(Course will not be offered in 1986-87.)*

231. *Mathematical Methods in Chemical Engineering.* 3 hr. PR: Math. 18. Classification and solution of mathematical problems important in chemical engineering. Treatment and interpretation of engineering data. Analytical methods for ordinary and partial differential equations including orthogonal functions and integral transforms. 3 hr. lec.

251. *Metallurgical Engineering.* 3 hr. PR: Phys. 12. Principles of production of metals and alloys, plastic deformation of metals, corrosion and metal failure. 3 hr. lec. *(Course will not be offered in 1986-87.)*

253. *Ceramic Engineering.* 3 hr. PR: Phys. 12. Characertization of ceramic systems. Study of internal structure and structure sensitive properties; liquid and solid solutions; rheology; mechanical, thermal, chemical, optical, and electrical properties. 3 hr. lec. *(Course will not be offered in 1986-87.)*

258. *Polymers and Polymer Technology.* 3 hr. Coreq.: Chem. 134. Polymers and their handling. Properties of macromolecules as influenced by molecular weight, polymerization methods, plastics technology, polymer engineering. 3 hr. lec.

270. *Strategy of Process Engineering.* 3 hr. PR: Ch.E. 111 or consent. Latest theories of process design and process optimization, proven through regular use by practicing engineers, are applied to the major problems of process engineering. 3 hr. lec. *(Course will not be offered in 1986-87.)*

280. *Chemical Engineering Problems.* 1-6 hr. For juniors, seniors, and graduate students. May be used to correct deficiencies before or following courses such as Ch.E. 170 and 171, or for other students desiring to take only a portion of a course.

290. *Introduction to Nuclear Engineering.* 3 hr. PR: Junior standing. Introduction to fundamental principles and applications of nuclear technology in science and engineering fields. Studies of nuclear fission and the design and operation of nuclear reactor systems; uses of radioisotopes as power sources and in materials processing, testing and medicine; health physics and radiation detection and shielding. 3 hr. lec. *(Course will not be offered in 1986-87.)*

301. *Transport Phenomena.* 3 hr. PR: Consent. Introduction to the equations of change (heat, mass and momentum transfer) with a differential balance approach. Use in Newtonian flow, turbulent flow, mass and energy transfer, radiation, convection. Estimation of transport coefficients. 3 hr. lec.

307. *Distillation.* 2-5 hr. PR: Math. 18 and consent. Vaporization principles of separation of liquid mixtures, steam, batch, continuous, azeotropic, extractive, and molecular distillation. 3 hr. lec., 0-6 hr. lab.

323. *Advanced Process Development.* 3 hr. PR: Consent. Extended and generalized unit process and operation concepts; specialized process synthesis methods; reaction mechanisms and their effects on equipment design and performance; material properties, their evaluation, prediction and marketability; evaluation of process. 3 hr. lec. *(Course will not be offered in 1986-87.)*

330. *Process Dynamics and Control.* 3 hr. PR: Consent. Dynamic response of processes and control instruments. Use of Laplace transforms and frequency response methods in analysis of control systems. Application of control systems in chemical reactors, distillation, and heat transfer operations. Introduction to nonlinear systems. 3 hr. lec.

344. *Thermodynamics.* 3 hr. PR: Consent. Logical development of thermodynamic principles. These are applied to selected topics including development and application of the phase rule, physical and chemical equilibria in complex systems and non-ideal solutions. 3 hr. lec.

345. *Chemical Reaction Engineering.* 3 hr. PR: Consent. Homogeneous reactions, batch and flow reactors, ideal reactors, macro and micro mixing, non-ideal flow reactors, heterogeneous reaction systems, catalytic and non-cataloyic reactions, reactor stability analysis, reactor optimization. 3 hr. lec.

358. *Polymer Processing.* 3 hr. PR: Chem. 134 or consent. Analytical description of rheology, molding, extrusion, bonding, polymer modification operations, and physical properties. 3 hr. lec.

370. *Process Equipment Design.* 3 hr. PR: Ch.E. 301 or consent. Design, sizing, optimization, and cost estimation of equipment used for heat transfer, emphasis on design techniques, computer design techniques discussed where applicable. 3 hr. lec.

371. *Process Equipment Design.* 3 hr. PR: Ch.E. 301 or consent. Design and selection of separation processes including crystallization, leaching, extraction, distillation, adsorption, filtration, membrane, and diffusional separation processes. Similarities between separation processes based on mode of operation are emphasized. 3 hr. lec.

390. *Nuclear Reactor Systems.* 3 hr. PR: Consent. Intended as a first course for graduate students in the area of power reactor systems analysis and design. Includes topics such as neutron interactions with reactor materials, fission, reactor physics, reactor heat generation and removal, and thermal reactor core design. 3 hr. lec.

391. *Nuclear Reactor Systems.* 3 hr. PR: Ch.E. 390. Continuation of Ch.E. 390. Reactor kinetics, nuclear power economics, and case studies and analysis of the following reactor systems: pressurized-water, boiling water, fast breeder, and gas-cooled power plants. 3 hr. lec.

392. *Interaction of Radiation and Matter.* 1-3 hr. PR: Consent. Types of radiation, energy deposition by radiation, experimental instrumentation, formation and reactions of radiation-chemical species. 1-3 hr. lec.

Civil Engineering (C.E.)

1.* *Surveying.* 2 hr. PR: Math. 4. Elementary theory and practice of the measurement of distance, angles, and difference in elevation. Office computation and plotting. 1 hr. lec., 3 hr. lab.

5.* *Land Surveying.* 4 hr. PR: Math. 4. Theory and practice with compass, transit, level, and stadia. Computations of area, earthwork volumes, and horizontal and vertical curves; astronomical observations; boundary surveying; and map plotting. 2 hr. lec., 6 hr. lab.

101. *Survey Engineering.* 4 hr. PR: Sophomore standing. Theory of measurements and errors, traverse computations, meridian determination, state plane coordinates, horizontal and vertical curves, easement curves, earthwork volumes, topographic mapping, construction surveying, and boundary surveying. 3 hr. lec., 3 hr. lab.

110. *Civil Engineering Materials.* 4 hr. PR: M.A.E. 43 or consent. Physical, chemical, and molecular properties of materials commonly employed in civil engineering works. Influence of these properties on the performance and use of materials. Emphasis on laboratory evaluation of properties that control the performance of materials. 3 hr. lec., 3 hr. lab.

120. *Fluid Mechanics and Hydraulics.* 4 hr. PR: Math. 18, M.A.E. 42. Fluid statics, kinematics and dynamics of fluid flow, flow measurements, flow in pressure conduits and open channels, similitude and dimensional analysis, and applications of turbomachines. 3 hr. lec., 3 hr. lab.

132. *Introduction to Transportation Engineering.* 4 hr. PR: C.E. 101. Integrated transportation systems from the standpoint of assembly, haul, and distribution means. Analysis of transport equipment and traveled way. Power requirements, speed, stopping, capacity, economics, route location. Future technological developments and innovations. 3 hr. lec., 3 hr. lab.

146. *Sanitary Engineering 1.* 3 hr. PR: C.E. 120. Population prediction and hydrology as applied to the design of water storage reservoirs and the design of water distribution, wastewater, and stormwater collection systems. 2 hr. lec., 3 hr. lab.

147. *Sanitary Engineering 2.* 3 hr. PR: Junior standing. Examination of water and wastewater, analysis and design of water and wastewater treatment systems including treatment and disposal of residuals. 2 hr. lec., 3 hr. lab.

160. *Structural Analysis 1.* 3 hr. PR: M.A.E. 43 or consent. Stability and determinacy of structures; shear and bending moment diagrams of determinate beams and frames; analysis of trusses; determination of displacements of planar structures by geometric and energy methods. 3 hr. lec.

*May be taken as undergraduate work by students in other colleges and schools.

181. *Introductory Soil Mechanics.* 3 hr. PR: C.E. 110. Introduction to geotechnical engineering, origin and formation of soils, fundamental soil properties, classification of soils, soil compaction, soil water and seepage, stresses in soils, compressibility and consolidation, shear strength, lateral earth pressures. 2 hr. lec., 3 hr. lab.

195. *Seminar.* (Credit.) PR: Junior or senior standing. Lectures by noted engineering and engineering-related practitioners and educators. Discussion of matters of mutual concern to students and faculty.

196. *Professional Development.* 1 hr. *(May be repeated four times.)* PR: Junior standing. The presentation of selected seminars, minicourses, and workshops on topics related to the planning, design, construction, and management of civil engineering systems.

201. *Principles of Boundary Surveying.* 3 hr. PR: C.E. 101 or consent. A study of the retracement requirements for metes and bounds survey systems. The study will include interpretation and writing of the property descriptions, legal principles related to boundary establishment, and analytical approaches to boundary location. 3 hr. lec.

208. *Control Surveying.* 3 hr. PR: C.E. 101. A study of the measurement and computational techniques used to locate precisely positions on the surface of the earth. 2 hr. lec., 1 hr. lab.

212. *Concrete and Aggregates.* 3 hr. PR: C.E. 110 or consent. Considerations and methods for the design of concrete mixes. Properties of portland cement and aggregates and their influence on the design and performance of concrete mixtures. Testing of concrete and aggregate and the significance of these tests. 2 hr. lec., 3 hr. lab.

213. *Construction Methods.* 3 hr. PR: Junior or senior standing in civil engineering. Study of construction methods, equipment, and administration with particular emphasis on the influence of new developments in technology. 3 hr. lec.

220. *Computational Fluid Mechanics.* 3 hr. PR: C.E. 120, Engr. 2, or consent. Use of the computer in elementary hydraulics, open channel flow, potential flow, and boundary layer flow, numerical techniques for solution of algebraic equations, ordinary differential equations, and partial differential equations. 3 hr. lec.

231. *Highway* Engineering. 3 hr. PR: C.E. 132, 181. Highway administration, economics and finance; planning and design; subgrade soils and drainage; construction and maintenance. Design of a highway. Center-line and grade-line projections, earthwork and cost estimate. 2 hr. lec., 3 hr. lab.

233. *Urban Transportation Planning and Design.* 3 hr. PR: C.E. 132 or consent. Principles of planning and physical design of transportation systems for different parts of the urban area. Land use, social, economic, and environmental compatibilities are emphasized. Evaluation and impact assessment.

235. *Railway Engineering.* 3 hr. PR: C.E. 101. Development and importance of the railroad industry. Location, construction, operation, and maintenance. 3 hr. lec.

240. *Applied Hydrology.* 3 hr. PR: Consent. The hydrologic cycle with emphasis on precipitation and runofff as related to design of hydraulic structures, soil and water conservation, and flood control. 3 hr. lec.

245. *Properties of Air Pollutants.* 3 hr. PR: Consent. Physical, chemical, and biological behavioral properties of dusts, droplets, and gases in the atmosphere. Air pollutant sampling and analysis. Planning and operating air pollution surveys. 2 hr. lec., 3 hr. lab.

251. *Public Health Engineering.* 3 hr. PR: Consent. Engineering aspects involved in control of the environment for protection of health and promotion of comfort of humans. Communicable disease control, milk and food sanitation, air pollution, refuse disposal, industrial hygiene, and radiological health hazards. 3 hr. lec.

252. *Water Resources Engineering.* 3 hr. PR: C.E. 146. Application of hydrologic and hydraulic principles in the design and analysis of water resources systems. Topics include hydraulic structures, economics and water law irrigation, hydroelectric power, navigation, flood-drainage litigation, and water-resources planning. 3 hr. lec.

260. *Structural Analysis 2.* 3 hr. PR: C.E. 160. Fundamental theory of statically indeterminate structures. Analysis of indeterminate beams, frames, and trusses by stiffness and flexibility methods; computer aided structural analysis by standard computer codes; study of influence lines for beams, frames, and trusses. 3 hr. lec.

270. *Reinforced Concrete Design.* 3 hr. PR: C.E. 110, 160; PR or Conc.: C.E. 260. Behavior and design of reinforced concrete members. Material properties; design methods and safety considerations; flexure; shear; bond and anchorage; combined flexure and axial load; footings; introduction to torsion, slender columns, and prestressed concrete. 2 hr. lec., 3 hr. lab.

271. *Steel Design.* 3 hr. PR: C.E. 110, 160; PR or Conc.: C.E. 260. Design of steel bridge and building systems with emphasis on connections, beams, columns, plastic design, and cost estimates. 3 hr. lec.

274. *Timber Design.* 3 hr. PR: C.E. 110, 160; PR or Conc.: C.E. 260. Fundamentals of modern timber design and analysis. Topics include wood properties, design of beams, columns, trusses, and pole structures using dimension lumber, glue-laminated products, and plywood. 3 hr. lec.

281. *Foundations Engineering.* 3 hr. PR: C.E. 181. The practice of geotechnical engineering, subsurface explorations, geotechnical analysis and design of shallow and deep foundations, retaining structures, stability of earth slopes, soil and site improvement. 3 hr. lec.

283. *Earthwork Design.* 3 hr. PR: C.E. 181. Use of soil mechanics principles in the analysis, design, and construction of earth structures. Principles of compaction and compaction control; an introduction to slope stability analysis and landslides; earth reinforcement systems, and ground improvement techniques. 3 hr. lec.

290. *Civil Engineering Problems.* 1-6 hr. PR: Junior or senior standing. Special topics in various aspects of civil engineering analysis, design, and construction.

291. *Comprehensive Project for Civil Engineering.* 3 hr. PR: Senior standing in civil engineering. Application of civil engineering principles, through group studies, to develop a solution for a comprehensive engineering problem. Consideration given to a problem involving all aspects of civil engineering. 1 hr. lec., 6 hr. lab.

293. *Basic Finite Element Methods.* 3 hr. PR: Senior standing or consent. Simplified treatment of theoretical basis of finite element method, background theory, formulation and applications: stress analysis in axial columns, one-dimensional heat and fluid flow, consolidation, beam-column analysis, mass transportation and overland flow.

296. *Civil Engineering Studies.* 1-3 hr. *(Only 3 hr. credit may be applied toward the B.S.C.E. degree.)* PR: Consent. Supervised internships and field experience in civil engineering analysis, design, and construction.

307. *Photogrammetry.* 3 hr. PR: C.E. 101. Camera calibration, stereoscopy, parallax, geometry of vertical and oblique photographs, theory and techniques of orientation, stereoscopic plotting instruments and analytical methods. 2 hr. lec., 3 hr. lab.

310. *Bituminous Materials and Mixtures.* 3 hr. PR: C.E. 110 or consent. Manufacture, testing, and nature of bituminous mixtures including the influence of aggregates, temperature, and other variables on mix design. Significance of test methods and specifications. Construction practice. 2 hr. lec., 3 hr. lab.

311. *Pavement Design.* 3 hr. PR: C.E. 281 or consent. Effects of traffic, soil, environment, and loads on the design and behavior of pavement systems. Design of pavement systems. Consideration of drainage and climate. Pavement performance and performance surveys. 3 hr. lec.

320. *Groundwater Dynamics.* 3 hr. PR: Consent. Introduction to groundwater, formulation of equations for saturated and unsaturated flow, analytical solutions for steady and transient cases, transport of pollutants and numerical techniques. 3 hr. lec.

321. *Environmental Fluid Mechanics.* 3 hr. PR: Consent. Equations of motion including buoyancy and Coriolis force, mechanics of jets and plumes, diffusion, dispersion, and mixing in rivers, lakes, reservoirs, and estuaries. 3 hr. lec.

332. *Airport Planning and Design.* 3 hr. PR: C.E. 132 or consent. Financing, air travel demand modeling, aircraft trends, traffic control, site selection, ground access, noise control, geometric design, pavement design, terminal facilities. 3 hr. lec. *(Course will not be offered in 1986-87.)*

333. *Geometric Design of Highways.* 3 hr. PR: Consent. The theory and practice of geometric design of modern highways. Horizontal and vertical alignment, cross-slope, design speed, sight distances, interchanges, and intersections. Critical analysis of design specifications. 2 hr. lec., 3 hr. lab.

334. *Introduction to Traffic Engineering.* 3 hr. PR: C.E. 132 or consent. The purpose, scope, and methods of traffic engineering. Emphasis on the three basic elements of each element and interactions between the elements. Laboratory devoted to conducting simple traffic studies, solving practical problems, and designing traffic facilities. 2 hr. lec., 3 hr. lab. *(Course will not be offered in 1986-87.)*

336. *Highway Planning.* 3 hr. PR: Consent. Theory and practice of highway investment decision-making with emphasis on quantitative techniques of traffic assignment and travel demand forecasting, system evaluation, establishing priorities and programming in rural and urban highway systems. 3 hr. lec.

337. *Public Transportation Engineering.* 3 hr. PR: Consent. Design of rail and highway modes for urban and rural areas. Consideration of vehicle technology, facility and route design, conventional and paratransit services, and related marketing, finance, and coordination issues. 3 hr. lec.

338. *Highway Safety Engineering.* 3 hr. PR: C.E. 231 or consent. Relationship between human, vehicular, and roadway factors which impact safety; functional requirements of highway safety features; legal aspects; accident analysis; evaluation of highway safety projects. 3 hr. lec.

339. *Traffic Engineering Operations.* 3 hr. PR: C.E. 334 or consent. Theory and practice of application of traffic engineering regulations; traffic control concepts for urban street systems and freeways; freeway surveillance and incident management; driver information systems; traffic control system technology and management. 3 hr. lec. *(Course will not be offered in 1986-87.)*

349. *Solid Waste Disposal.* 3 hr. PR: Consent. Patterns and problems of solid waste storage, transport, and disposal. Examination of various engineering alternatives with appropriate consideration for air and water pollution control and land reclamation. Analytical approaches to recovery and reuse of materials. 2 hr. lec., 3 hr. lab.

350. *Sanitary Chemistry and Biology.* 3 hr. PR: C.E. 147 or consent. Study of physical and chemical properties of water. Theory and methods of chemical analysis of water, sewage, and industrial wastes. Biological aspects of stream pollution problems. 2 hr. lec., 3 hr. lab.

353. *Hazardous Waste Control Engineering.* 3 hr. PR: Consent. Definition of hazards; unit processes for hazardous waste treatment; secure land disposal of hazardous wastes; cleanup of hazardous material spills and abandoned waste dumps; related topics. 3 hr. lec.

356. *Principles of Biological Waste Treatment.* 3 hr. PR: C.E. 350 or consent. Examination of biological treatment systems related to microbiology and function. Models used to describe system behavior and kinetics are developed. Laboratory and field experiments are performed to understand the relation between operation and design. 2 hr. lec., 3 hr. lab.

361. *Statically Indeterminate Structures.* 3 hr. PR: C.E. 260 or consent. Force and displacement methods of analysis; energy principles and their application to trusses, frames, and grids; effects of axial forces; influence lines for frames, arches, and trusses; secondary stress analysis. 3 hr. lec.

363. *Introduction to Structural Dynamics.* 3 hr. PR: C.E. 361 or 460. General theory for dynamic response of systems having one or several degrees of freedom. Emphasis on the application of dynamic response theory to structural design. 3 hr. lec.

373. *Prestressed Concrete.* 3 hr. PR: C.E. 260, 270 or consent. Behavior and design of prestressed concrete members. Materials, bending, shear, torsion, methods of prestressing, prestress losses, deflections, compression members, composite members, indeterminate structures. 3 hr. lec. *(Course will not be offered in 1986-87.)*

380. *Soil Properties and Behavior.* 3 hr. PR: C.E. 281 or consent. Soil mineralogy and the physico-chemical properties of soils and their application to an understanding of permeability, consolidation, shear strength, and compaction. Prediction of engineering behavior of soils in light of physico-chemical concepts. 3 hr. lec.

381. *Soil Testing.* 3 hr. PR: C.E. 181 or consent. Experimental evaluation of soil properties and behavior. Emphasis is placed on the proper interpretation of experimental results and application of such results to practical problems. 1 hr. lec., 6 hr. lab.

385. *Airphoto Interpretation.* 3 hr. Study of techniques for obtaining qualitative information concerning type and engineering characteristics of surficial materials. Use of airphoto interpretation for evaluation of engineering problems encountered in design and location of engineering facilities. 3 hr. lec. *(Course will not be offered in 1986-87.)*

393. *Advanced Finite Element Methods.* 3 hr. PR: C.E. 293, or consent. Formulation procedures and applications of finite element methods to two-, three-dimensional problems, techniques for nonlinear analysis, computer implementation; applications in field problems, flow, and dynamics.

Electrical Engineering (E.E.)

21. *Introduction to Electrical Engineering.* 3 hr. PR: Engr. 2, Math. 16, Phys. 11. Electrical engineering units, circuit elements, circuit laws, measurement principles, mesh and node equations, network theorems, energy storage elements, RC and RL circuits, unit step response, second order circuits, sinusoids and phasors and introduction to network theory. 3 hr. lec.

22. *Introduction to Electrical Engineering Laboratory.* 1 hr. Coreq.: E.E. 21. Laboratory experiments in measurement of electrical quantities and circuit parameters. Use of the digital computer to solve circuit problems. 3 hr. lab.

24. *Electrical Circuits.* 3 hr. PR: E.E. 21, E.E. 22, Math. 18 (or Coreq.). Introduction to network analysis. Sinusoidal (AC) steady state, average and RMS values, polyphase systems, complex frequency, network frequency response, two port networks and transformers, Fourier methods and Laplace Transforms. 3 hr. lec.

25. *Electrical Circuits Laboratory.* 1 hr. Coreq.: E.E. 24. Laboratory experiments in measurement of electrical circuit behavior and parameters. Use of digital computer to solve circuit problems. 3 hr. lab.

71. *Introduction to Digital Logic Design.* 3 hr. PR: Engr. 2 or consent. An introduction to the design of digital networks and computers. Topics include number systems, coding, Boolean and switching algebra, logic design, minimization of logic, sequential networks, and design of digital subsystems. 3 hr. lec.

101. *Introduction to Electrical Power Devices and Systems.* 3 hr. PR: Junior or senior standing in engineering (not open to Electrical Engineering majors). Fundamental principles of electric and magnetic properties. DC and AC circuits. Application to single- and three-phase systems, motor control, circuit protection, safety. 3 hr. lec.

102. *Basic Electrical Laboratory.* 1 hr. Coreq: E.E. 101. Laboratory experiments in measurement of electrical quantities and circuit parameters. 3 hr. lab.

103. *Introduction to Electronic Instrumentation.* 3 hr. PR: Junior or senior standing in engineering (Not open to Electrical Engineering majors). Electrical fundamentals, analog and digital devices and circuits, communication and telemetry, measurement instruments and techniques. 3 hr. lec.

104. *Instrumentation Laboratory.* 1 hr. Coreq.: E.E. 103. Laboratory experiments demonstrating the characteristics of electron devices and the performance of digital and analog instrumentation and control systems. 3 hr. lab.

124. *Signals and Systems 1.* 3 hr. PR: Math. 18, E.E. 24. Introduction to linear systems models and solutions in the time and frequency domains. Balanced emphasis is placed on both continuous and discrete time and frequency methods. 3 hr. lec.

126. *Signals and Systems 2.* 3 hr. PR: E.E. 124. Statistical description of nondeterministic signals, correlation functions and spectral density. Sampling theory, filtering random signals and noise. Modulation techniques, AM/FM/TV transmitters/receivers. Concepts applied to various communication and feedback systems. 3 hr. lec.

127. *Signals and Systems 1 Laboratory.* 1 hr. Coreq.: E.E. 124. Laboratory experiments in measurement of electrical system and signal parameters. 3 hr. lab.

130. *Electromechanical Energy Conversion.* 3 hr. PR: E.E. 124, 127, 140. Fundamentals of electromechanical energy conversion, transformers and rotating machinery. 3 hr. lec.

131. *Introduction to Power Systems.* 3 hr. PR: E.E. 130, 135. Analysis of power system elements connected together as an integrated system for the transmission and distribution of electric power. Load flow, symmetrical components. 3 hr. lec.

135. *Energy Conversion Laboratory.* 1 hr. Coreq: E.E. 130. DC motor and generator performance and characteristics, single-phase transformer, AC machines, synchronous machine and induction motor performances and characteristics. 3 hr. lab.

136. *Power Systems Laboratory.* 1 hr. Coreq.: E.E. 131. The power system simulator is used for experiments dealing with generation, transmission, distribution, and protection. The aspect of interconnection with other systems is explored. 3 hr. lab.

140. *Electric and Magnetic Fields 1.* 3 hr. PR: Math. 18, Phys. 12. Introduction to vector analysis, orthogonal coordinate systems, Maxwell's equations, scalar and vector

potentials, electric and magnetic static fields, boundary-value problems, Laplace's and Poisson's equation, electromagnetic static fields. 3 hr. lec.

141. *Electric and Magnetic Fields 2.* 3 hr. PR: E.E. 140. Plane waves in lossless and dissipative media, polarization, reflection and refraction of plane waves, lossless and dissipative transmission lines, waveguides, radiation and antennas. 3 hr. lec.

143. *Electromagnetic Field Theory.* 3 hr. PR: Math. 18, Physics 12. Introduction to vector analysis, orthogonal coordinate systems, Maxwell's equations, scalar and vector potential, electric and magnetic fields, plane waves, reflection and refraction of plane waves, transmission lines.

151. *Electronic Properties of Materials.* 3 hr. PR: E.E. 24, 25, Phys. 12, Math. 18. Physical principles of electric charge transport in solids and gases. Application of these principles to the study of junction diodes and bipolar and field-effect transistors, their terminal characteristics and circuit behavior. 4 hr. lec.

153. *Electronic Properties of Materials.* 1 hr. PR: E.E. 24, 25, Physics 12, Math. 18. Physical principles of electric charge transport in solids. Application of these principles to the study of junction diodes, their terminal characteristics and circuit behavior.

156. *Digital Electronics.* 2 hr. PR: E.E. 71, 124, 127, 151. Description of electronic logic gates and their use in implementing combinational expressions, arithmetic units, registers, and counters. Special emphasis is placed on logic levels, circuit configuration, interfacing, and A/D-D/A conversion. 2 hr. lec.

157. *Digital Electronics Laboratory.* 1 hr. Coreq.: E.E. 156. Design, fabrication, and measurement of digital electronic circuits. Use of discrete devices, integrated logic, display devices, and timer circuits. Study of A/D and D/A circuits and interfaces. 3 hr. lab.

158. *Analog Electronics.* 3 hr. PR: E.E. 124, 127, 151. Electronic devices in analog circuits. Small-signal and graphical analysis of BJT and FET circuits; frequency response, feedback, and stability. Linear and nonlinear operational amplifier circuits. Power amplifiers and power control by electronic devices. 3 hr. lec.

159. *Analog Electronics Laboratory.* 1 hr. Coreq.: E.E. 158. Design, fabrication, and measurement of analog electronic circuits. Use of discrete devices, integrated circuits, operational amplifiers, and power electronic devices. Study of biasing and stability, frequency response, filters, analog computation circuits, and power control circuits. 3 hr. lab.

180. *Senior Design Seminar.* 1 hr. PR: E.E. 156 and 157 or 158 and 159, consent. (Must be taken the semester immediately before taking E.E. 181.) Seminar on selected topics leading to the selection of a project for E.E. 181. Other topics include professional development, legal and ethical aspects of engineering. 1 hr. lec.

181. *Senior Design Project.* 3 hr. PR: E.E. 130, 156, 158, E.E. 180 or consent. The application of engineering analysis, principles, and practical consideration to the design and execution of an electrical engineering project. Emphasis is placed on the professional approach of the analysis and solution of an engineering problem. 3 hr. lec.

208. *Power Electronics.* 3 hr. PR: E.E. 130 and E.E. 158, 159 (concurrently) or consent. Application of power semiconductor components and devices to power system problems; power control, conditioning processing, and switching. Course supplemented by laboratory problems. 3 hr. lec.

216. *Fundamentals of Control Systems.* 3 hr. PR: E.E. 124, 127. Introduction to classical and modern control; signal flow graphs; state-variable characterization; time-domain, root-locus, and frequency techniques; stability criteria. 3 hr. lec.

230. *Electrical Power Distribution Systems.* 3 hr. PR: E.E. 131, 136 or consent. General considerations; load characteristics; subtransmission and distribution substations; primary and secondary distribution, secondary network systems; distribution transformers; voltage regulation and application of capacitors; voltage fluctuations; protective device coordination. 3 hr. lec.

231. *Power Systems Analysis.* 3 hr. PR: E.E. 131, 136 or consent. Incidence and network matrices, Y-Bus, symmetrical and unsymmetrical faults, load-flow and economic dispatch, MW-frequency and MVAR-voltage control. The power system simulator will be used for demonstrations. 3 hr. lec.

234. *Power System Control and Stability.* 3 hr. PR: E.E. 131, 136 or consent. Synchronous machine equations and equivalent circuit, swing equation, classical model, small disturbance, machine-infinite bus, damping and synchronizing torques, linear model. The power system simulator will be used for demonstrations. 3 hr. lec.

244. *Introduction to Antennas and Radiating Systems.* 3 hr. PR: E.E. 141 or consent. Fundamentals, parameters, radiation integrals, linear antennas, far-field approximations, loop antennas, arrays and continuous distributions, mutual impedance, broadband dipoles and matching techniques, traveling wave and broadband antennas, frequency independent antennas, and aperture antennas. 3 hr. lec.

245. *Microwave Circuits and Devices.* 3 hr. PR: E.E. 141. UHF transmission line theory, impedance matching techniques and charts, general circuit theory of one port and multiports for waveguiding systems, impedance and scattering matrices, waveguide circuit elements, microwave energy sources. Course will be supplemented by laboratory problems. 3 hr. lec.

246. *Radar and RF Systems Engineering.* 3 hr. PR: E.E. 126, 141, 158, 159. An introduction to radar system fundamentals and techniques, including a discussion of modulation and detection theory, RF amplifiers, mixers, antennas, and propagation effects. Application of probability and statistics to signal processing and detection in noise. 3 hr. lec.

251. *Noise and Grounding of Electronic Systems.* 1 hr. PR: E.E. 158, 159 or consent. Description of extrinsic and intrinsic noise. Techniques for noise reduction in electronic circuits. 1 hr. lec.

252. *Operational Amplifier Applications.* 3 hr. PR: E.E. 158, 159. Linear integrated circuit building blocks applied to such functions as amplification, controlled frequency response, analog-digital conversion, sampling, and waveform generation. 2 hr. lec., 3 hr. lab.

253. *Physical Electronics 1.* 3 hr. PR: E.E. 151. Properties of semiconductors and electrical conduction processes in solids. Determining the characteristics of discrete electronic devices. Introduction to masers and lasers. 3 hr. lec.

257. *Transistor Circuits.* 3 hr. PR: E.E. 158, 159 or equiv. Analysis and design of subcircuits used in analog integrated circuit modules. Transistor models, low-frequency response of multistage amplifiers, current sources, output stages and active loads. 3 hr. lec.

259. *Solid State RF Engineering.* 3 hr. PR: E.E. 124, 141, 156, 158, or corequisite. Analysis and design of electronic circuitry for RF telecommunications systems. Treatment of electrical noise, RF amplifiers, oscillators and mixers. Applications to AM/FM/TV. Receiver and transmitter technology for HF/VHF/UHF and satellite communication. 3 hr. lec.

264. *Introduction to Communications Systems.* 3 hr. PR: E.E. 126. Introduction to the first principles of communications systems design. Analysis and comparison of standard analog and pulse modulation techniques relative to bandwidth, noise,

threshold, and hardware constraints. Communications systems treated as opposed to individual circuits and components of the system. 3 hr. lec.

268. *Digital Signal Processing Fundamentals.* 3 hr. PR: E.E. 126, 127, 156, 157. Theories, techniques, and procedure used in analysis, design, and implementation of digital and sampled data filters. Algorithms and computer programming for software realization. Digital and sampled data realizations, switched capacitor and charge-coupled device IC's. 3 hr. lec.

270. *Digital Systems Design.* 2 hr. PR: E.E. 71. Hierarchical design methods, from the machine architecture, through data flow concepts and control flow concepts, to implementation. Topics include: design methodology, design techniques, machine organization, control unit implementation and interface design.

272. *Introduction to Computer Architecture.* 3 hr. PR: E.E. 71. Basic digital systems and computer architecture. Definition of information storage concepts, central processor designs, and input/output concepts. Content addressable memories, microprogrammed control, addressing techniques, interrupts, and cycle stealing.

273. *Computer Interfacing Techniques.* 3 hr. PR: E.E. 274. Analysis and design of computer systems with emphasis on interfacing and data communications. Bus and memory systems, parallel serial and analog interfaces, the man-machine interface.

274. *Introduction to Microprocessor-Based Design.* 3 hr. PR: E.E. 156, 157, 272 or consent. Microprocessor terminology and system design. A systems approach is taken to individual student designs of microprocessor systems. A "hands-on" electronic development approach is taken using state-of-the-art computer technology. 3 hr. lec.

275. *Microprocessor Interfacing Techniques.* 3 hr. PR: E.E. 274. Interfacing components and methods are analyzed in terms of their applications and electronics requirements. Includes driver/ receiver circuits, high power interface devices, A/D D/A interfacing, timing margins, serial/parallel communications, interrupt-driven and direct memory access. *(A working microprocessor is required.)* 3 hr. lec.

278. *Analogue Computers.* 3 hr. PR: Math. 18. The theory and operation of analogue computers. Amplitude scaling and time scaling on the computer and application of computer to solution of differential equations. 3 hr. lec.

280. *Electrical Problems 1.* 1-3 hr. PR: Junior, senior, or graduate standing.

281. *Biomedical Electrical Measurements.* 2 hr. PR: E.E. 158 and 159 or consent. Biomedical instrumentation for human subjects. Origin and characteristics of biological electrical signals. Instrument design requirements and detailed analysis of cardiac support and intensive-care monitoring equipment. 2 hr. lec.

312. *Feedback System Theory.* 3 hr. PR: E.E. 216, 325. Signal flow graphs; sensitivity; return difference; mathematical definition of feedback; effects of feedback; multiple loop systems; multivariate systems. 3 hr. lec.

315. *State Variable Analysis of Systems.* 3 hr. PR: Consent. Matrix theory and linear transformations as applied to linear control systems. The state-space on time-domain study of stability, controllability, observability, etc. 3 hr. lec.

316. *Synthesis of Feedback Systems 1.* 3 hr. PR: E.E. 312, 364. Methods of direct synthesis and optimization of feedback systems; Wiener theory; Pontryagin's maximum principles; dynamic programming; adaptive feedback systems. 3 hr. lec.

325. *Advanced Linear Circuit Analysis.* 3 hr. PR: Consent. Systematic formulation of circuit equations. Use of operational techniques to find total solutions. Applications and characteristics of the Laplace and Fourier transforms. Matrix algebra, complex variable theory and state variables are made to circuit analysis and elementary circuit synthesis. 3 hr. lec.

328. *Modern Network Synthesis.* 3 hr. PR: E.E. 325 or consent. Two-terminal network synthesis; Brune and Bott-Duffin syntheses; four-terminal networks; modern filter synthesis; Darlington synthesis; transfer-function synthesis; ladder and lattice synthesis; potential analogy and approximation. 3 hr. lec.

330. *Advanced Electrical Machinery.* 3 hr. PR: E.E. 131, 136 or consent. Theory and modeling of synchronous, induction, and dc machines; their steady-state and transient analysis. 3 hr. lec.

331. *Electrical Power Systems 2.* 3 hr. PR: E.E. 231 or consent. Electrical transients on power systems including traveling waves due to lightning and switching. Principles of lightning protection. 3 hr. lec.

333. *Application of Digital Computers to Power System Analysis 1.* 3 hr. PR: E.E. 231 or consent. Incidence and network matrices; algorithms for their formulation; three-phase networks; short-circuit calculations; load-flow studies. 3 hr. lec.

340. *Electromagnetic Fields and Guided Waves 1.* 3 hr. PR: E.E. 141 or equiv. Plane waves in dielectrics, conducting, and anisotropic media; polarization; radiation; duality; uniqueness; image theory; equivalence principle; Green's functions; integral equations; plane wave functions. 3 hr. lec.

344. *Advanced Antenna Theory.* 3 hr. PR: E.E. 244 or equiv. Aperture antennas; geometrical theory of diffraction, horns; reflectors and lens antennas; antenna synthesis and continuous sources; moment method; Fourier transform methods; antenna measurements. 3 hr. lec.

350. *Electronic Circuits.* 3 hr. PR: E.E. 157 and 158, or equiv. Analysis and design of electronic circuits; low-pass amplifiers, feedback, frequency response and stability of feedback amplifiers, nonlinear analog circuits, noise. 3 hr. lec.

353. *Physical Electronics 2.* 3 hr. PR: E.E. 157, 158 or equiv. Semiconductor surfaces; surface states, space charge and the field effect. 3 hr. lec.

357. *Linear Integrated Circuits.* 3 hr. PR: E.E. 157, 158 or equiv. *(Primarily for students specializing in communication and electronics.)* Techniques of integrated circuit design and fabrication. Development of models descriptive of linear and nonlinear transistor operation. Design and analysis of high frequency tuned, dc, and differential amplifiers. 3 hr. lec.

358. *Integrated Logic Circuits.* 3 hr. PR: E.E. 157, 158 or equiv. or consent. *(Intended for students specializing in digital circuits.)* Techniques of integrated circuit design and fabrication. Development of transistor model for nonlinear operation. Design, analysis, and comparison of emitter-coupled, direct-coupled, diode-transistor, and transistor-transistor integrated logic circuits. 3 hr. lec.

364. *Communication Theory.* 3 hr. PR: E.E. 264 or consent. Detailed study of probability theory and its use in describing random variables and stochastic processes. Emphasis on applications to problems in communication system design. 3 hr. lec.

366. *Information Theory 1.* 3 hr. PR: E.E. 364. Probability concepts; theory of discrete systems; encoding; theory of continuous systems; systems with memory; the fundamental theorem of information theory. 3 hr. lec.

370. *Switching Circuit Theory 1.* 3 hr. PR: E.E. 71 or equiv. Course presumes an understanding of the elements of Boolean or switching algebra. Study of both combinational and sequential switching circuits with emphasis on sequential networks. Advanced manual design and computer-aided design techniques for single and multiple output combinational circuits. Analysis and design of sequential circuits. Detection and prevention of undesired transient outputs. 3 hr. lec.

372. *Advanced Computer Architecture.* 3 hr. PR: E.E. 71 and 272 or consent. Formal tools for designing large digital systems are introduced; formal descriptive algebras such as ISP, PMS, AHPL, CDL, and others. An in-depth study of computer system designs including instruction design and data path design. 3 hr. lec.

373. *Design of Computer Arithmetic Circuits* 1. 3 hr. PR: E.E. 71 or equiv. Detailed study of computer circuitry usable in performing binary arithmetic. Logic, circuitry, and engineering aspects of digital computer equipment design. Primary emphasis on design of high speed, parallel arithmetic units using the natural binary number system. Analysis of systems for representing negative numbers. Study of various means for obtaining high speed addition, subtraction, and multiplication. 3 hr. lec.

374. *Design of Computer Arithmetic Circuits* 2. 3 hr. PR: E.E. 373. Continuation of E.E. 373. High speed binary division, floating point arithmetic, modular or residue arithmetic, and techniques for checking arithmetic are covered. Recent innovations studied as literature becomes available. 3 hr. lec.

390. *Advanced Independent Study.* 1-6 hr. PR: Consent. Individual investigation in advanced electrical engineering subjects not covered in formal courses.

Industrial Engineering (I.E.)

20. *Fundamentals of Industrial Engineering.* 1 hr. PR: Sophomore standing. An introduction to the basic principles of industrial engineering.

100. *Manufacturing Processes.* 3 hr. PR: Ch.E 105; Conc.: M.A.E. 43. Lectures, demonstrations, and laboratory work relating to methods, materials, properties, and equipment, and characteristics of machining, casting, joining, and forming operations. Engineering and economic analysis of the processes. 2 hr. lec., 3 hr. lab.

113. *Engineering Statistics.* 3 hr. PR: Math. 17. The use of statistical analysis in engineering decision making. Topics covered include basic statistical methods of describing data, common statistical distributions encountered in engineering, test of hypotheses, confidence intervals, and simple linear regression.

140. *Motion and Time Study.* 3 hr. PR: Sophomore standing. Principles and techniques, job analysis, standardization, and formula construction; stop watch and micro-motion analysis of industrial operations; development of production and incentive standards. Human factors. 2 hr. lec., 3 hr. lab.

170. *Accounting for Engineers.* 3 hr. PR: Sophomore standing. The accounting cycle, journals, and ledgers; fixed assets and depreciation; financial statements. Essentials of cost accounting. Emphasis on utilization of cost data and reports by management, indicating management's control over industrial operations.

201. *Principles of Solidification.* 3 hr. PR: I.E. 100 or consent. Material and energy balances, solidification of metals, riser and gating systems for castings, fluidity of metal, casting design, and molding processes.

214. *Analysis of Engineering Data.* 3 hr. PR: I.E. 113. Introduction to linear statistical models. Design and analysis of simpler experimental configurations occurring frequently in engineering studies. Similarities and differences between regression and experiment design models emphasized in a vector-matrix setting.

215. *Statistical Decision Making.* 3 hr. PR or Conc.: I.E. 113. Basic concepts of probability theory. Discrete and continuous distributions, joint and derived distributions, with application to industrial and research problems. Introduction to generating functions and Markov chains.

216. *Industrial Quality Control.* 3 hr. PR: I.E. 113. Principles and methods for controlling the quality of manufactured products, with emphasis on both economic and statistical aspects of product acceptance and process control.

222. *Job Evaluation and Wage Incentives.* 3 hr. PR: I.E. 140 or consent. Principles used in evaluating jobs, rates of pay, characteristics and objectives of wage incentive plans, incentive formulae and curves.

240. *Labor and Productivity.* 3 hr. PR: Consent. The work force as a critical element of productivity. Topics include industrial engineering involvement in collective bargaining, labor relations, and work practices.

242. *Production Planning and Control.* 3 hr. PR: I.E. 140; Conc.: I.E. 214. Principles and problems in forecasting, aggregate planning, material management, scheduling, routing, and line balancing.

243. *Facility Planning and Design.* 3 hr. PR: I.E. 242, 250. Problems of facility and equipment location. Long-range planning of industrial facilities. Block and detailed layout of manufacturing plants and general offices. Space utilization and allied topics in facility design.

249. *Design of Dynamic Materials Systems.* 3 hr. PR: I.E. 140 or consent. Application of industrial engineering theory and practice to selection of material systems and equipment including efficient handling of materials from first movement of raw materials to final movement of finished product. Present quantitative design techniques.

250. *Introduction to Operations Research.* 3 hr. PR: I.E. 113, 281. Basic tools and philosophies of operations research. Tools include: linear programming, Markov chains, queuing theory, and simulation. Other operations research techniques are presented as they relate to the overall systems philosophy.

251. *Analytical Techniques of Operations Research.* 3 hr. PR: I.E. 113 or consent. Nonlinear optimization techniques useful in operations research and industrial engineering studies. Classical optimization techniques, quadratic, geometric and dynamic programming, branch and bound and gradient techniques.

259. *Introduction to Systems Engineering.* 3 hr. PR: I.E. 250 or consent. Quantitative synthesis of OR models. Definition of terms. Development and testing of assumptions, objectives, and restrictions. Measurement of parameters in the model. Optimization techniques and error sensitivity of the optimal solution. Implementing, utilizing, and updating the model.

260. *Human Factors Engineering.* 3 hr. PR: I.E. 113 and I.E. 140 or equiv. Includes the study of ambient environment, human capabilities and equipment design. Systems design for the human-machine environment interfaces will be studied with emphasis on health, safety, and productivity.

261. *System Safety Engineering.* 3 hr. PR: Consent. The concepts of hazard recognition, evaluation analysis and the application of engineering design principles to the control of industrial hazards.

277. *Engineering Economy.* 3 hr. PR: Math. 15; Junior standing. Compound interest formulas for comparing alternatives before and after taxes. Depreciation principles, sensitivity analysis, replacement and risk analysis. Pay-back period, benefit-cost, and life cycle costing.

280. *Industrial Engineering Problems.* 1-3 hr. PR: Consent. Special problems.

281. *Computer Applications in Industrial Engineering.* 3 hr. PR: Engr. 2; I.E. 140. Introduction to computer applications in manufacturing. Emphasis on system design and analysis and the role of computers in productivity improvement.

282. *Digital Computer Concepts.* 3 hr. PR: I.E. 281 or consent. Principles of digital computer functional components. Study of digital operating systems including structure of the various subsystem components such as monitors, input control systems, and loaders.

283. *Information Retrieval.* 3 hr. PR: I.E. 281 or consent. Tools, elements, and theories of information storage and retrieval. Documentation, information framework; indexing; elements of usage, organization, and equipment; parameters and implementation; theories of file organization and system design.

284. *Simulation by Digital Methods.* 3 hr. PR: I.E. 113, 281, or consent. Introduction to Monte Carlo simulation methods and their application to decision problems. Student identifies constraints on problems, collects data for modeling and develops computer programs to simulate and analyze practical situations. Interpretation of results emphasized.

291. *Design of Productive Systems 1.* 3 hr. PR: Senior standing in industrial engineering. The integration of industrial engineering principles in the design of productive systems. Emphasis will be on analysis of different systems for productivity management.

292. *Design of Productive Systems 2.* 3 hr. PR: Senior standing in industrial engineering. Continuation of I.E. 291.

300. *Special Topics in Manufacturing Processes and Automation.* 3 hr. PR: I.E. 100 or equiv. Special topics concerning manufacturing processes and automation with special emphasis on manufacturing management.

302. *Advanced Manufacturing Processes.* I. 3 hr. PR: I.E. 100. Metal cutting economic models, solidification processes, bulk deformation, sheet metal and drawing, joining design and economics. Overall view of manufacturing systems. Introduction to numerical control programming and projects on numerical control equipment.

304. *Materials and Processing Systems Design.* 3 hr. PR: I.E. 100. The engineering design process, material design properties and selection systems, decision making and problem analysis techniques for materials and processing. Economic and cost systems, expert systems, failure analysis and quality systems for materials and process selection.

308. *Advanced Problems in Manufacturing Engineering.* 1-3 hr. PR: I.E. 300 or 302; graduate standing. Special problems relating to one of the areas of manufacturing engineering, such as manufacturing processes, robotics, CAD/CAM, group technology, and manufacturing systems engineering.

314. *Design of Industrial Experiments.* 3 hr. PR: I.E. 214 or consent. Continuation of I.E. 214. Study of more complex experimental design especially useful to engineering and industrial researchers, including factorials and optimum-seeking design. Emphasis on use of existing digital computer routines and interpretation of results.

325. *Engineering Management.* 3 hr. A study of the unique problems of engineering organizations including project planning, managing creativity, coordinating design and development and other topics relevant to engineering organizations.

338. *Technology Forecasting.* 3 hr. A study of various procedures used in forecasting technological developments.

339. *Technology Assessment.* 3 hr. A study of various procedures used in technology assessment. The implications of technology in various aspects of society stressed.

340. *Work Analysis.* 3 hr. PR: Consent. Analysis of industrial engineering's involvement in analyzing work situations. Particular emphasis will be given to the use of industrial engineering as a change agent in improving work practices.

341. *Methods Analysis and Work Simplification.* 3 hr. Advanced study of techniques of methods analysis, including modern means of methods research. Development of appropriate cost analysis to accompany improved operating plans. Design, installation, and administration of work simplification programs, suggestion

systems, and remuneration policies, and the means of intraplant communications concerning such programs. 2 hr. lec., 3 hr. lab.

342. *Advanced Production Control.* 3 hr. PR: I.E. 250. Different mathematical models useful in the design of effective production control systems. Various models covered include: static production control models under risk and under uncertainty, dynamic models under certainty, under uncertainty, and under risk.

353. *Applied Linear Programming.* 3 hr. PR: I.E. 250 or consent. Application of the assignment, transportation, and simplex algorithms to typical industrial problems. The methods and computational efficiencies of the revised simplex and other algorithms are also studied.

354. *Case Studies in Operations Research.* 3 hr. PR: Consent. This course will examine the applications of operations research procedures in a variety of applications. The course objective is to examine the factors which lead to successful model building through case studies.

355. *Scheduling and Sequencing Methods.* 3 hr. PR: I.E. 250. Theory and applications of analytical models used in the scheduling of operations. Topics include single machine scheduling models, flow shop models, job shop models, and assembly line balancing methods.

358. *Special Topics in Systems Analysis and Operations Research.* 3-6 hr. PR: Consent. Special topics from recent developments in operations research and related fields. Special emphasis on interests of current graduate students.

359. *Operations Research for Public Administrators.* 3 hr. Examination of role of quantitative analysis in pubic administration and decision making.

360. *Human Factors System Design.* 3 hr. PR: I.E. 260 or consent. Theoretical aspects and practical applications of man/machine relationships as they influence future system design. Student examines human limitations with respect to acceptance of information, decision making, and ability to transmit the result decisions to controlled equipment systems to obtain design optimization. 2 hr. lec., 3 hr. lab.

361. *Industrial Hygiene Engineering.* 3 hr. Introductory course in industrial hygiene, legal standards, historical context, and development. Topics include: respiratory physiology, particle size and deposition, ionizing and non-ionizing radiation, physical stress, solvents, metals, pesticides, painting, welding, and degreasing.

362. *Systems Safety Engineering.* 3 hr. PR: I.E. 261 or consent. Analysis of manufacturing methods, processes and properties of materials from a system safety engineering viewpoint. Emphasis will be placed on hazard analysis techniques (fault tree, MORT, failure modes, and effects), and machine guarding methods.

364. *Industrial Ergonomics.* 3 hr. PR: I.E. 260 or consent. Practical experience in the application of ergonomic principles to industrial problems. Safety and production implications of work physiology, industrial biomechanics, and circardian rhythms, as well as current interest topics.

377. *Advanced Engineering Economy.* 3 hr. PR: Consent. Special emphasis on depreciation, engineering and economy aspects of selection and replacement of equipment; relationship of technical economy to income taxation, effect of borrowed capital and pricing model. 3 hr. lec.

381. *Integrated Data Processing.* 3 hr. PR: I.E. 281 and consent. Advanced work in electronic data-processing systems and procedures design. Case studies of integrated data-processing systems. Course projects include individual use of a computer in management data-processing analysis problems. 3 hr. lec.

385. *Digital Computer Applications.* 1 hr. PR: Senior standing in engineering, physical science or mathematics. Special study of selected programming languages.

389. *Special Topics in Industrial Data Processing Systems.* 3 hr. PR: I.E. 281 or consent. Selected topics relating to industrial applications of computer and data processing systems. Emphasis on applications not in the FORTRAN language.

Mechanical and Aerospace Engineering (M.A.E.)

NOTE: Courses in M.A.E. are open only to Engineering majors except those marked with an asterisk (*).

12. *Introduction to Aerospace Engineering.* 3 hr. PR: Math. 16, Engr. 2. Fundamental physical quantities of a flowing gas, standard atmosphere, basic aerodynamic equations, airfoil nomenclature, lift, drag, and aircraft performance are studied. Digital computer usage applied to aerodynamic and performance problems and aircraft design. 3 hr. lec.

32. *Introduction to Mechanical Engineering.* 3 hr. PR: Engr. 1, 2; Coreq.: M.A.E. 41. Introduction to principles and techniques in mechanical engineering. 1 hr. lec.; 4 hr. lab.

41. *Statics.* 3 hr. Coreq.: Math. 16. Engineering applications of equilibrium of forces. Vector operations, couple and moment of force, resultants (2 and 3 dimensions), center of gravity and center of pressure, static friction, free body diagrams, equilibrium, trusses and frames. 3 hr. lec. or equivalent programmed instruction.

42. *Dynamics.* 3 hr. PR: M.A.E. 41; Coreq.: Math. 17. Newtonian dynamics of particles and rigid bodies. Engineering applications of equations of motion, work and energy, conservative forces, impulse and momentum, impulsive forces, acceleration in several coordinate systems, relative motion, instantaneous centers, and plane motion. 3 hr. lec. or equivalent programmed instruction.

43. *Mechanics of Materials.* 3 hr. PR: M.A.E. 41; Coreq.: Math. 17. Analysis of stress, deformation, and failure of solid bodies under the action of forces. Internal force resultants, stress, strain, Mohr's circle, mechanical properties of engineering materials, generalized Hooke's Law. Analysis axial, bending and buckling loads and combinations. 3 hr. lec. or equivalent programmed instruction.

53. *Dynamics and Strength Laboratory.* 1 hr. PR: M.A.E. 32; Coreq.: M.A.E. 42, 43. Experiments will cover basic concepts in dynamics and strength of materials. Rigid body behavior, system acceleration, material properties, etc. will be studied. 3 hr. lab.

100. *Inspection Trip.* (Credit.) PR: Senior standing.

101. *Thermodynamics.* 3 hr. PR: Phys. 11, Math. 17. Principles of thermodynamics; properties of gases and vapors; vapor cycles; internal combustion engines cycles; and refrigeration. Not open to students majoring in mechanical engineering. 3 hr. lec.

104. *Analysis of Physical Systems.* 3 hr. PR: Math. 18, M.A.E. 42 or consent. Modeling of physical system behavior using analytical techniques. Laplace transforms, complex variables, mapping, and matrix methods applied to mechanical system, fluid flow, and structural analyses. 3 hr. lec.

110. *Dynamics of Machines 1.* 3 hr. PR: M.A.E. 42; Coreq.: Math. 18. Kinematic analysis and synthesis of linkage, gears, cams, and other basic mechanisms. 3 hr. lec. *(Final Offering, Fall 1986.)*

113. *Applied Kinematics and Dynamics.* 3 hr. PR: M.A.E. 42; Coreq.: Math. 18. Analysis of motion and forces in linkages, gears, cams and other basic mechanisms. Synthesis of linkages, cam, and gear profiles. Techniques introduced include algebraic, graphic, and numeric modeling. 3 hr. lec. *(Offered first time, Fall 1987.)*

114. *Fluid Mechanics.* 3 hr. PR: M.A.E. 41. Fluid statics, laminar and turbulent flow of compressible and incompressible fluids, flow measurements, open channel flow, and kinetics of fluids. 3 hr. lec.

115. *Experimental Fluid Dynamics 1.* 3 hr. PR: M.A.E. 112. Subsonic and supersonic wind tunnel testing methods and practice. Experiments include the following measurements: Pressure distribution of bodies, boundary layer determination, turbulence measurements, force tests, and stability and performance determinations. Corrections for scale and jet boundary effects. Test design, data analysis, and engineering report preparation. 1 hr. lec., 3 hr. lab.

116. *Fluid Dynamics 1.* 3 hr. PR: Math. 18, M.A.E. 114. Kinematics and dynamics of vector fluid flow fields; perfect fluid theory of thin airfoils; lifting line theory for finite span wings. 3 hr. lec.

117. *Fluid Dynamics 2.* 3 hr. PR: M.A.E. 140 and 116 or 144. Compressible, nonviscous fluids analysis and design; isentropic flow, Prandtl-Meyer expansions, shock waves, airfoils in compressible flow, and small perturbation theory. Introduction to viscous fluid dynamics and boundary layer theory. 3 hr. lec.

120. *Flight Vehicle Design.* 3 hr. PR: M.A.E. 142 or 146. Preliminary design of flight vehicles with regard for performance and stability requirements, considering aerodynamics, weight and balance, structure arrangement, configuration, guidance, and propulsion effects. Layout drawings and calculations are combined in a preliminary design report. 1 hr. lec., 6 hr. lab.

122. *Vibrations and Controls.* 3 hr. PR: M.A.E. 113. Fundamentals of vibration and control theories. Free and forced vibration of single- and multiple-degree of freedom systems. Response and stability analysis of linear control systems. 3 hr. lec. *(Offered first time, Fall 1988.)*

130. *Dynamics of Machines 2.* 3 hr. PR: M.A.E. 110. Static and dynamic force analysis in mechanical systems. Principles of vibration theory and balancing of rotating machinery. Rigid body motion and gyroscopes. 3 hr. lec. *(Final Offering, Spring 1987.)*

132. *Applied Strength of Materials.* 3 hr. PR: M.A.E. 43; Coreq.: Ch.E. 105. Overview of stress, strain and deflection; energy methods in deflection and column design; theories of failure and design, fatigue considerations in design, torsion, combined loadings, factor of safety and material considerations in design. 3 hr. lec. *(Offered first time, Spring 1988.)*

134. *Mechanical Engineering Design.* 3 hr. PR: M.A.E. 43, 130. Fundamentals of mechanical design. Analysis of stress, deformation and failure modes. Rational design and selection of mechanical elements. Theory of lubrication and wear. Problem formulation and optimization of solutions. 3 hr. lec. *(Final Offering, Fall 1987.)*

135. *Design of Mechanical Elements.* 3 hr. PR: M.A.E. 113, 132; Coreq.: I.E. 100. Mechanical design of such mechanical elements as screws and fasteners, welded joints, springs, contact and journal bearings, gears, shaft design, couplings, brakes and clutches, and ropes and chains. 3 hr. lec. *(Offered first time, Fall 1988.)*

136. *Engineering Systems Design.* 3 hr. PR: M.A.E. 134, 182. Identification and solution of challenging engineering problems through rational analysis and creative synthesis. Planning, designing, and reporting on complex systems on individual and group basis. 6 hr. lab. *(Final Offering, Spring 1988.)*

140. *Engineering Thermodynamics.* 3 hr. PR: Phys. 11, Math. 17. First and second laws of thermodynamics; energy equations; properties of gases and vapors; availability and thermodynamic relations. 3 hr. lec.

141. *Engineering Thermodynamics.* 3 hr. PR: M.A.E. 140. Continuation of M.A.E. 140. Gas and vapor cycles, mixtures of gases and vapors, chemical reactions, introduction to fluid mechanics. 3 hr. lec.

144. *Thermodynamics of Fluids.* 3 hr. Coreq.: M.A.E. 140. The dynamics and thermodynamics of fluids. Integral formulation of basic laws for closed and open systems and control volumes. Effects of heat conduction, viscosity, and compressibility on free and boundary flows. 3 hr. lec.

145. *Thermal and Fluids Laboratory.* 1 hr. Coreq.: M.A.E. 144. Laboratory experiments demonstrating the fundamental concepts of thermal-fluid systems: hydrostatics, dynamic pressure forces, dimensional analysis, pipe pressure losses, drag on external bodies, flow measurements devices, engine performance, fan and turbine performance, and saturated vapor curve determination. *(Offered first time, Fall 1987.)*

146. Flight Mechanics 1. 4 hr. PR: M.A.E. 42, 116. Fundamentals of aircraft static and dynamic stability and control; aerodynamic design of control surfaces. General equations of unsteady aircraft motion. Introduction to aerodynamic transfer functions and automatic control systems. 4 hr. lec.

150. *Flight Vehicle Propulsion.* 3 hr. PR: M.A.E. 112 or 117. Equilibrium combustion thermodynamics. Quasi one-dimensional flow with friction and total temperature change. Thermodynamics of aircraft engines. Aerodynamics of inlets, combustors, nozzles, compressors, and turbines. Performance of rockets. Ideal rocket analysis. 3 hr. lec.

158. *Heat Transfer.* 3 hr. PR: M.A.E. 140 and 144 or 114. Steady state and transient conduction Thermal radiation. Boundary layer equations for forced and free convection. 3 hr. lec. *(Offered first time, Spring 1988.)*

160. *Flight Vehicle Structures 1.* 3 hr. PR: M.A.E. 43. Strength of thin walled structures in bending, shear, and torsion. Strain energy and application of Castigliano's theorem to bending of rings and curved bars, and to anaylsis of frames. Principle of virtual work and its application to beam and truss deflections and to statically indeterminate structures. 3 hr. lec.

161. *Flight Vehicle Structures 2.* 3 hr. PR: M.A.E. 160. Tension fields and the design of Wagner beam. Buckling of compression structures; bars, sandwich columns, wrinkling in sandwich construction, plates, shells and stiffened panels. Design for minimum weight. Introduction to matrix methods of structural analysis. Failure by fatigue and fracture. 3 hr. lec.

162. *Design of Flight Structures 1.* 3 hr. PR: M.A.E. 161. Structural design and analysis of flight vehicle members. Layout and detail design of specified components and systems. 1 hr. lec., 6 hr. lab. *(Offered first time, Fall 1987.)*

165. *Experimental Flight Vehicle Structures.* 2 hr. PR: M.A.E. 160. Tension properties and stress-strain curves of materials. Strain gage circuitry. Elastic and inelastic column buckling testing and theoretical comparison. Structural dynamics testing of vibrating beams. Shear tests by torsion, and torsion of thin-walled members. Observation of photoelastic and Moire fringe pattern techniques, and an introduction to fatigue testing. 1 hr. lec., 3 hr. lab.

170.* *Aviation Ground School.* 3 hr. Nomenclature of aircraft, aerodynamics, civil air regulations, navigation, meteorology, aircraft, and aircraft engines. May serve as preparation for private pilot written examinations. 2 hr. lec., 2 hr. lab. *(Course will not be offered in 1986-87.)*

*May be taken as undergraduate work by students in other colleges and schools.

171. *Mechanical Engineering Analysis.* 3 hr. Coreq.: Math. 18. Numerical and graphical techniques applied to the solution of mechanical engineering problems. Analog and digital computer programming. Data analysis. 2 hr. lec., 3 hr. lab.

180. *Mechanical Engineering Measurements.* 3 hr. PR: M.A.E. 140. Static and dynamic measurements of pressure, temperature, force, stress, displacement, etc. Calibration of instruments and error analysis. 2 hr. lec., 3 hr. lab. *(Final offering, Fall 1987.)*

181. *Mechanical Engineering Instrumentation.* II. 3 hr. PR: Math. 18. Basic elements of general measurement systems. Principles of first and second order system input/output behavior. Study of common intermediate and output devices. Data collection and processing using microcomputers. Design of a specific measurement system. 2 hr. lec., 3 hr. lab. *(Offered first time, Spring 1988.)*

182. *Engineering Systems Laboratory.* 2 hr. PR: M.A.E. 180; Coreq.: M.A.E. 134, 144, 171, 250. Experimental evaluation of modern and complex engineering systems. Participation in groups with oral and written presentation of results. 6 hr. lab. *(Final Offering, Fall 1987.)*

183. *Principles of Engineering Design.* 3 hr. PR: M.A.E. 171; Coreq.: M.A.E. 135, 158. Topics include design problems in mechanical engineering dealing with analytical and/or experimental methodologies in fluid, thermal, and structural areas, decision-making techniques, optimization, computer aided design and economic considerations. 6 hr. lab. *(Offered first time, Fall 1988.)*

184. *Engineering Systems Design.* 3 hr. PR: M.A.E. 183. Identification and solution of challenging engineering problems through rational analysis and creative synthesis. Planning, designing, and reporting on complex systems on individual and group basis. 6 hr. lab. *(Offered first time, Spring 1989.)*

200. *Advanced Mechanics of Materials 1.* 3 hr. PR: M.A.E. 43 or consent. Advanced topics in applied stress analysis; stress concentrations, strain energy, beams, thick-walled cylinders, torsional warping, fracture. 3 hr. lec.

204. *Dynamics of Physical Systems.* 3 hr. PR: M.A.E. 42 and Math. 18 or consent. Physical systems such as hydraulic, mechanical, electrical, electromechanical, electrohydraulic, hydromechanical, and thermodynamic considered. Emphasis on the modeling of compound systems and studying their natural behavior using analytical techniques. Use of computers in analysis of physical systems. 3 hr. lab. *(Final Offering, Fall 1986.)*

210. *Kinematics.* 3 hr. PR: M.A.E. 130 and Math. 18 or consent. Geometry of constrained motion, kinematics synthesis and design, special linkage. Coupler curves, inflection circle, Euler-Savary equation, cubic of stationary curvature and finite displacement techniques. 3 hr. lec.

215. *Experimental Fluid Dynamics 2.* 3 hr. PR: M.A.E. 115. Continuation of M.A.E. 115 with increased emphasis on dynamic measurements. Shock tube/tunnel and subsonic and supersonic measurements. Experiments include optical techniques, heat transfer to models, and viscous flow measurements. Error analysis of test data. 2 hr. lec., 3 hr. lab.

216. *Applied Aerodynamics.* 3 hr. PR: M.A.E. 142 or 146. Chordwise and spanwise airload distribution for plain wings, wings with aerodynamic and geometric twist, wings with deflected flaps, and wings with ailerons deflected. Section induced drag characteristics. 3 hr. lec. *(Course will not be offered in 1986-87.)*

220. *Guided Missile Systems.* 3 hr. PR: M.A.E. 112 or 117 and/or Conc.: M.A.E. 150. Design philosophy according to mission requirements. Preliminary configuration and design concepts. Aerodynamic effects on missiles during launch and flight. Ballistic missile trajectories. Stability determination by analog simulation.

Performance determination by digital and analog simulation. Control, guidance, and propulsion systems. Operational reliability considerations. 3 hr. lec.

222. *Mechanical Vibrations.* 3 hr. PR: Math. 18, M.A.E. 130, or consent. Fundamentals of vibration theory. Free and forced vibration of single and multiple degree of freedom systems. Solution by Fourier and Laplace transformation techniques. Transient analysis emphasized. Energy methods. 3 hr. lec. *(Final Offering, Spring 1988.)*

232. *V/STOL Aerodynamics.* 3 hr. PR: M.A.E. 112 or 117. Fundamental aerodynamics of V/STOL aircraft. Topics include propeller and rotor theory, helicopter performance, jet flaps, ducted fans, and propeller-wing combinations. 3 hr. lec.

234. *Fluid Dynamics 3.* 3 hr. PR: M.A.E. 112 or 117. Fundamentals of viscous flow and the Navier-Stokes equation; incompressible laminar flow in tubes and boundary layers; transition from laminar to turbulent flow; incompressible turbulent flow in tubes and boundary layers. 3 hr. lec. *(Course will not be offered in 1986-87.)*

235. *Fluid Dynamics 4.* 3 hr. PR: M.A.E. 112 or 117. One-dimensional non-steady gas-dynamics. Shock tube theory and applications. Fundamentals of supersonic and hypersonic flow and determination of minimum drag bodies. 3 hr. lec.

236. *Systems Analysis of Space Satellites.* 3 hr. PR: Senior standing. Introduction to engineering principles associated with analysis and design of space satellites. Emphasis on the inderdisciplinary nature of satellite systems analysis. 3 hr. lec.

238. *Introduction to Underwater Engineering.* 3 hr. PR: Consent. Underwater portion of our world with emphasis on science and technology. Emphasis on economic and social needs for maritime resources, martime law, and public policy, as well as general and basic engineering aspects of underwater communication, navigation, and structures. 3 hr. lab. *(Course will not be offered in 1986-87.)*

240. *Problems in Thermodynamics.* 3 hr. PR: M.A.E. 141 or consent. Thermodynamic systems with special emphasis on actual processes. Problems presented are designed to strengthen the background of the student in the application of the fundamental thermodynamic concepts. 3 hr. lec.

241. *Flight Mechanics 2.* 3 hr. PR: M.A.E. 146. Fundamental concepts of feedback control system analysis and design. Automatic flight controls, and human pilot plus airframe considered as a closed loop system. Stability augmentation. 3 hr. lec. *(To be offered first time, Fall 1987.)*

242. *Flight Testing.* 3 hr. PR: M.A.E. 142 or 146. Applied flight test techniques and instrumentation, calibration methods, determination of static performance characteristics, and introducion to stability and control testing based on flight test of Cessna Super Skywagon airplane. Flight test data analysis and report preparation. 1 hr. lec., 6 hr. lab.

243. *Bioengineering.* 3 hr. PR: M.A.E. 43; Phys. 201 or consent. Introduction to human anatomy and physiology using an engineering systems approach. Gives the engineering student a basic understanding of the human system so that the student may include it as an integral part of the design. 3 hr. lec.

244. *Introduction to Gas Dynamics.* 3 hr. PR: M.A.E. 144 or consent. Fundamentals of gas dynamics, one-dimensional gas dynamics and wave motion, measurement, effect of viscosity and conductivity, and concepts of gas kinetics. 3 hr. lec.

249. *Space Mechanics.* 3 hr. PR: Math. 18, M.A.E. 42. Flight in and beyond the earth's atmosphere by space vehicles. Laws of Kepler and Orbital theory. Energy requirements for satellite and interplanetary travel. Exit from and entry into an atmosphere. 3 hr. lec.

250. *Heat Transfer.* 3 hr. PR: M.A.E. 101 or 140; M.A.E. 111 or 144. Steady state and transient conduction. Thermal radiation. Boundary layer equations and forced and free convection are also covered. 3 hr. lec. *(Final Offering, Fall 1987.)*

252. *Advanced Topics in Propulsion.* 3 hr. PR: M.A.E. 150 or consent. Special problems of thermodynamics and dynamics of aircraft power plants. Chemical rocket propellants and combustion. Rocket thrust chambers and nozzle heat transfer. Nuclear rockets. Electrical rocket propulsion. 3 hr. lec.

254. *Applications in Heat Transfer.* 3 hr. PR: M.A.E. 250. For students desiring to apply basic heat transfer theory and digital computation techniques to problems involving heat exchangers, power plants, electronic cooling, manufacturing processes, and environmental problems. 3 hr. lec.

260. *Design of Flight Structures 1.* 3 hr. PR: M.A.E. 161. Structural design and analysis of flight vehicle members. Layout and detail design of specified components are required. 1 hr. lec., 6 hr. lab. *(Final Offering, Spring 1986.)*

262. *Internal Combustion Engines.* 3 hr. PR: M.A.E. 101 or 141. Thermodynamics of internal combustion engine; Otto cycle; Diesel cycle, gas turbine cycle, two- and four-cycle engines, fuels, carburetion, and fuel injection; combustion; engine performance, supercharging. 3 hr. lec.

264. *Heating, Ventilating, and Air Conditioning.* 3 hr. PR: M.A.E. 141 or consent. Methods and systems of heating, ventilating, and air conditioning of various types of buildings, types of controls and their application. 3 hr. lec.

265. *Aeroelasticity.* 3 hr. PR: M.A.E. 160. Vibrating systems of single degree and multiple degrees of freedom, flutter theory and modes of vibration, torsional divergence and control reversal. 3 hr. lec.

275. *Computer-Aided Design: Applications.* 3 hr. PR: M.A.E. 134 or 161; Coreq.: M.A.E. 250. CAD fundamentals. User-computer interface and interactive programming for rational design. Computational tools, finite elements and modeling techniques. Interactive graphics, pre-post processor applications. Case studies: conceptual-preliminary-detail iterative design and analysis.

280. *Aerospace Problems.* 1-6 hr. PR: Upper-division and graduate standing.

282. *Engineering Acoustics.* 3 hr. PR: Math. 18 or consent. Theory of sound propagation and transmission. Important industrial noise sources and sound measurement equipment. Selection of appropriate noise criteria and control methods. Noise abatement technology. Laboratory studies and case histories. 3 hr. lec.

284. *Introduction to Feedback Control.* 3 hr. PR: Math. 18, E.E. 103 or M.A.E. 204 or consent. Fundamentals of automatic control theory. Transfer functions and block diagrams for linear physical systems. Proportional, integral, and derivative controllers. Transient and frequency response analysis using Laplace transformation. 3 hr. lec.

285. *Thesis.* 2-6 hr. PR: Senior standing and consent.

290. *Seminar.* 1-6 hr. PR: Junior, senior, or graduate standing, and consent.

291. *Introduction to Research.* 1-3 hr. PR: Senior standing and consent. Methods of organizing theoretical and experimental research. Formulation of problems, project planning, and research proposal preparation.

292. *Research Problems.* 2-6 hr. PR: M.A.E. 291 or consent. Performance of the research project as proposed in M.A.E. 291. Project results are given in written technical reports, with conclusion and recommendations.

294. *Special Topics.* 1-6 hr. PR: Junior, senior, or graduate standing, and consent.

299. *Special Problems.* 1-6 hr. PR: Junior, senior, or graduate standing.

300. *Seminar.* (Credit.) Attendance required of all aerospace graduate students at scheduled aerospace engineering seminars.

301. *Advanced Engineering Acoustics.* 3 hr. PR: M.A.E. 282 or consent. Study of complex sound generation and the propagation, transmission, reflection, and absorption of air-borne and structure-borne sound. Coupling of sound and vibration in structures. Acoustical behavior and characteristics of materials.

305. *Analytical Methods in Engineering 1.* 3 hr. PR: Consent. Index notification for determinants, matrices, and quadratic forms; linear vector spaces, linear operators including differential operators; calculus of variations, eigenvalue problems, and boundary value problems.

306. *Analytical Methods in Engineering 2.* 3 hr. PR: M.A.E. 305 or at least two semesters of advanced calculus. Intended for advanced graduate students interested in modern analysis for engineering applications.

307. *Nonlinear Analysis in Engineering.* 3 hr. PR: Consent. Special topics in nonlinear analysis of various types of engineering systems. Various numerical, approximate, and analytical techniques chosen to suit the needs and interests of advanced graduate students.

310. *Advanced Mechanics of Materials 2.* 3 hr. PR: M.A.E. 320 or consent. Mechanics of composite materials: anisotropic stress-strain relations and property characterization, lamina behavior, general liminate analysis, environmental effects. 3 hr. lec.

312. *Inelastic Behavior of Engineering Materials.* 3 hr. PR: M.A.E. 41, 42, 43, and consent. Characterization and modeling of typical engineering materials, elastic, viscoelastic, and plastic materials, design considerations.

315. *Fluid Flow Measurements.* 3 hr. PR: M.A.E. 112 or 117, or consent. Principles and measurements of static and dynamic pressures and temperatures, velocity and Mach number and forces. Optical techniques and photography. Design of experiments. Review of selected papers from the literature. 2 hr. lec., 3 hr. lab.

316. *Energy Methods in Applied Mechanics.* 3 hr. PR: Consent. Variational principles of mechanics and applications to engineering problems; principles of virtual displacements, minimum potential energy, and complementary energy. Castigliano's theorem, Hamilton's principle. Applications to theory of plates, shells, and stability. 3 hr. lec.

318. *Continuum Mechanics.* 3 hr. PR: M.A.E. 41, 42, 43. Basic laws of physical behavior of continuous media. Analysis of stress; equations of motion and boundary conditions; kinematic analysis; rates of strain, dilation and rotation; bulk time, rates of change; constitutive equations with special attention to elastic bodies and ideal fluids; energy equations and the first law of thermodynamics. 3 hr. lec.

320. *Theory of Elasticity 1.* 3 hr. Cartesian tensors; equations of classical elasticity, energy, minimum, and uniqueness theorems for the first and second boundary value problems; St. Venant principle; extension, torsion, and bending problems. 3 hr. lec.

322. *Advanced Vibrations 1.* 3 hr. PR: M.A.E. 222 or consent. Dynamic analysis of multiple degree of freedom discrete vibrating systems. Lagrangian formulation matrix and numerical methods, impact and mechanical transients.

325. *Experimental Stress Analysis.* 3 hr. PR: M.A.E. 41, 42, 43. Classical photoelasticity, brittle lacquers, birefrigent coatings, strain gage techniques and instrumentation, as applied to problems involving static stress distributions. 2 hr. lec., 3 hr. lab.

330. *Instrumentation in Engineering 1.* 3 hr. PR: Consent. Theory of measuring systems, emphasizing measurement of rapidly changing force, pressure, strain, temperature, vibration, etc. Available instruments, methods of noise elimination, types of recording studied. Special value to student in experimental research. 2 hr. lec., 3 hr. lab.

333. *Advanced Machine Design.* 3 hr. PR: M.A.E. 134 or consent. Design for extreme environments, material selection, lubrication and wear, dynamic loads on cams, gears, and bearings, balancing of multi-engines and rotors, electromechanical components.

340. *Advanced Thermodynamics 1.* 3 hr. PR: M.A.E. 141 or consent. First and second laws of thermodynamcs with emphasis on the concept of entropy production. Application to a variety of nonsteady open systems, thermodynamics of multiphase, multicomponent, and reacting systems. Criteria for equilibrium and stability.

342. *Advanced Thermodynamics 2.* 3 hr. PR: M.A.E. 340 or consent. Continuation of topics related to reactive systems. Adiabatic flame temperatures, reaction kinetics, conservation of species equations, flame propagation and detonation.

344. *Statistical Thermodynamics.* 3 hr. PR: M.A.E. 340 or equiv. Microscopic thermodynamics for Boltzmann, Bose-Einstein, and Fermi-Dirac statistics. Schrodinger wave equation, partition functions for gases and solids. *(Course will not be offered in 1986-87.)*

348. *Heat Transfer.* 3 hr. PR: Undergraduate course in heat transfer or consent. *(Primarily for mechanical and aerospace engineering students.)* Topics include one-, two-, and three-dimensional thermal conduction involved in mechanical processes both for constant and time varying temperature fields, free and forced convection in heat exchangers, heat power equipment and aircraft and radiative heat transfer between surfaces and absorbing media as found in furnaces, industrial processes, and aerospace applications. *(Course will not be offered in 1986-87.)*

350. *Conduction Heat Transfer.* 3 hr. PR: M.A.E. 250 or consent. Analytical, numerical, graphical, and analog solutions of steady and non-steady heat conduction problems in isotropic and anistropic solids. Thermal properties, extended surfaces, thermal stress, interphase conduction with moving interface, localized and distributed sources.

352. *Intermediate Dynamics.* 3 hr. PR: M.A.E. 42. Newtonian and Lagrangian mechanics. Dynamics of discrete systems and rigid bodies analyzed utilizing Newtonian and Lagrangian formulations.

353. *Advanced Dynamics 1.* 3 hr. PR: M.A.E. 352 or consent. Analytical mechanics. Stability of autonomous and non-autonomous systems considered and analytical solutions by perturbation techniques introduced. Hamilton-Jacobi equations developed. Problems involving spacecraft, gyroscopes, and celestial mechanics studied.

354. *Convection Heat Transfer.* 3 hr. PR: M.A.E. 250 or consent. Laminar and turbulent flows. Analytical, numerical, and analogical solution. Selected topics study of current research publications.

355. *Radiation Heat Transfer.* 3 hr. PR: M.A.E. 250 or consent. Classical derivation of black body radiation laws; gray body and non-gray analysis; radiant properties

of materials, radiant transport analysis; specular-diffuse networks, gas radiation, thermal radiation measurements; analytical, numerical solutions, and study of selected current publications.

360. *Fluid Mechanics 1.* 3 hr. PR: M.A.E. 144 or equiv. Advanced dynamics and thermodynamics of fluids. Basic laws of conservation of mass and momentum in differential, vector, and integral forms. Application to internal flows, fluid machinery, and structures.

364. *Turbomachinery.* 3 hr. PR: M.A.E. 101 or 141. Flow problems encountered in design of water, gas, and steam turbines, certrifugal and axial flow pumps and compressors, design parameters.

380. *Special Problems.* 2-4 hr. PR: Consent of department chairperson. For graduate students in the non-research program. The student will select a specialized field and follow a course of study in that field under the supervision of a counselor.

381. *Specialized Study Program.* 1-6 hr. PR: Consent. Discussion and individual study reports in aerospace engineering.

384. *Feedback Control in Mechanical Engineering.* 3 hr. PR: M.A.E. 284 or consent. Control analysis of hydraulic and pneumatic closed-loop systems including spool valves, flapper valves, pumps, servomotors, and electrohydraulic servo-mechanisms. Investigation on nonlinearities by phase plane, Liapunov, and describing function techniques. Programming for analog and digital computer simulation. Introduction to fluidic elements and logic circuits.

394. *Special Topics.* 1-6 hr. For senior and graduate students.

399. *Special Problems.* 1-6 hr. PR: Senior or graduate standing.

University Honors Program

The University Honors Program is designed to provide a cohesive, integrated program of Honors courses which will apply toward the satisfaction of general education and/or core requirements.

Admission to the program is by invitation only. Enrollment in the program is limited so that class sizes can remain small, affording students an opportunity to participate in individualized, concentrated instruction. It is anticipated that any student accepted into the program will be enrolled in one Honors course each semester, will be a full-time student at WVU (enrolled for at least 12 hours a semester), and will maintain a grade-point average in accordance with standards established by the University Honors Director and the University Honors Council.

Academic Program

In addition to fulfilling the University Honors Program requirements, Honors students fulfill all University requirements and major area of concentration requirements. Enrollment in the University Honors Program does not mean that a student must take more courses than other students, simply that such a student uses the Honors courses to fulfill part of the University requirements for graduation.

Honors students, at the appropriate time in their academic career, enter areas of concentration in which they earn their degrees and fulfill, in the usual way, requirements established by the academic areas involved. Diplomas and transcripts indicate both degree earned and completion of the University

Honors Program. Certification for the student's identification as a University Honors Scholar is given by the University Honors Director or a designated member of the University Honors Council. This certification is to be completed by the end of the penultimate semester before graduation.

Requirements for designation as a University Honors Scholar are as follows:

1. Completion of a minimum number of hours in designated Honors courses. Of these, 3 hours will be earned in a senior-year seminar and at least 3 and no more than 6 hours in a summer guided-project program. These Honors hours will not be in addition to the hours normally required for graduation. They will be part of that total requirement.

2. While it is expected that an Honors student will be enrolled in an Honors course each semester, demands of professional programs, etc., may make adjustments necessary with the adviser's approval.

3. Normally only courses designated as Honors courses by the Honors Director and the Honors Council will be counted toward fulfillment of the Honors Program requirements. However, if a student takes courses judged by the Council to be rigorous and challenging enough to qualify as Honors courses, the student may petition, in advance, the Director and Council for permission to count the hours as Honors hours. In each case, the student must submit a petition to the Director and the Council for such an exception. Each instance will be judged separately and on its own merits and the Director and the Council must state in writing the decision reached. This statement will be placed on the student's record and will be part of the academic record.

4. Once a student is accepted into the University Honors Program, continuance will depend upon satisfactory progress in hours earned (enrollment for at least 12 hours a semester) and maintenance of a satisfactory cumulative grade-point average as outlined below:

a. 1-28 hours earned, inclusive 3.2
b. 29-88 hours earned, inclusive 3.3
c. 89 or more 3.4

If a student fails to maintain satisfactory progress toward the degree and/or to achieve the required minimum cumulative grade-point average, the student will be placed on probation in the University Honors Program for one semester. If at the end of that semester the student has not achieved the required grade-point average and/or the number of hours completed, the student will be dropped from the University Honors Program. This action will not by itself affect the student's standing as a student in the University or in the degree program. It does mean that the student will not be designated a University Honors Scholar upon graduation.

Honors

192. *Senior Honors Seminar.* I, II. 3 hr. PR: Senior standing and membership in University Honors Program and permission of University Honors Program Director. Careful investigation of and independent research on a topic approved in advance by the University Honors Director-University Honors Council, and instructor.

College of Human Resources and Education

If you enjoy working with people in helping them realize their potential, the College of Human Resources and Education will prepare you for a career in such fields as counseling, dietetics, home economics, speech pathology and audiology, special education, health education, teaching, and human services in business, industry, and governmental agencies.

The College of Human Resources and Education is organized into four divisions and provides program areas of Community Health Education; Early, Middle Childhood and Adolescent Education; Education Foundations; Educational Psychology; Family Resources; Reading; Special Education; Speech Pathology and Audiology; and Technology Education. Degrees in many teaching fields—from early childhood education to secondary school specializations—are offered through the Division of Education. The most modern instructional facilities strengthen the specialized programs provided in Speech Pathology and Audiology. Students in Family Resources may study in such fields as textiles and clothing, nutrition and foods, interior design and housing, home economics, and child development.

Programs lead to the baccalaureate degree, preparation for graduate work, certification and licensure in teaching, or other specialization related careers. A strong liberal arts background is necessary for students to benefit fully from the college's programs. Students spend part of their first two academic years taking such liberal arts courses as literature, economics, history, mathematics, and courses in the natural and physical sciences. Students preparing for teaching careers are also exposed to classroom experiences early in their academic program.

The College of Human Resources and Education and the West Virginia Department of Education are in the process of reviewing and revising all certification programs. Students are warned that programs printed in the Catalog *may not be in effect at the time of their registration and are advised to see their adviser upon arrival on campus.*

Admission

Requirements for admission to the undergraduate programs of the College of Human Resources and Education are listed by program areas in subsequent pages of this *Catalog*.

Freshman

Speech Pathology and Audiology, Family Resources, and Teacher Education use the standard WVU requirements.

Transfers

Speech Pathology and Audiology requires a 2.5 grade-point average on all work attempted.

Family Resources requires a 2.0 grade-point average on all work attempted.

Teacher Education requires a 2.5 grade-point average on all work attempted *and* acceptable scores on the required competency tests in reading, writing, mathematics, listening, speaking, and computer literacy.

Complete information concerning WVU admissions, fees, and expenses is in Part 2. Academic information is in Part 3.

Faculty

Diane L. Reinhard, Ph.D. (Ohio St. U.), *Dean of College of Human Resources and Education and Professor.*
John O. Andes, Ed.D. (U. Fla.), *Associate Dean and Professor.*
Ernest R. Goeres, Ph.D. (U. Iowa), *Associate Dean and Associate Professor.*
Katherine C. Lovell, Ph.D. (U. Ore.), *Assistant to the Dean.*

Clinical and Counseling Division

Counseling Psychology and Rehabilitation

Professors

L. Sherlyn Cormier, Ph.D. (Purdue U.)—Counseling. Clinical supervision, Counseling psychology training models, Social modeling.
William H. Cormier, Ed.D. (U. Tenn.)—Counseling. Interview strategies, Assessment-families, Cognitive intervention.
James S. DeLo, Ph.D. (U. Pitt)—Counseling. Multi-cultural transaction, Biofeedback.
Ranjit K. Majumder, Ph.D. (U. Okla.)—Rehabilitation. Psychology, Rehabilitation.
Robert R. Marinelli, Ed.D. (Penn St. U.)—*Rehabilitation Counseling Program Coordinator.* Career counseling and development, Psychological and vocational problems of handicapped persons.
Robert L. Masson, Ed.D. (SUNY)—Rehabilitation. Group counseling.
Jeffrey K. Messing, Ed.D. (Syracuse U.)—*Division Director, Counseling Psychology Program Coordinator.* Vocational psychology, Consulting models, Program design.
Joseph B. Moriarty, Ph.D. (Fordham U.)—Rehabilitation. Psychology, Rehabilitation.
David J. Srebalus, Ed.D. (Ind. U.)—Counseling. Criminal justice, Work adjustment, Therapist in mental health.
Roy H. Tunick, Ed.D. (U. N. Colo.)—Rehabilitation. Vocational evaluation assessment.
Michael T. Yura, Ph.D. (Ohio St. U.)—Counseling. Child play therapy, Handicapped children, Vocational development.

Associate Professors

Kathryn B. Greever, Ed.D. (WVU)—Rehabilitation. Grant development.
Edward F. Jacobs, Ph.D. (Fla. St. U.)—Counseling. Group counseling, Marriage and family.

Speech Pathology and Audiology

Professor

Norman J. Lass, Ph.D. (Purdue U.)—Speech Pathology. Speech perception, Speech acoustics.

Associate Professors

Carolyn P. Atkins, Ed.D. (WVU)—Speech Pathology. Speech improvement, Clinical supervision.
Dennis M. Ruscello, Ph.D. (U. Ariz.)—Speech Pathology. Language, Articulation, Clinical supervision.
Kenneth O. St.Louis, Ph.D. (U. Minn.)—Speech Pathology. Fluency, Voice, Clinical supervision.
Mary Ellen Tekieli-Koay, Ph.D. (U. Okla.)—*Program Coordinator, Speech Pathology.* Cleft palate, Neurophysiology, Neuropathologies.
Charles M. Woodford, Ph.D. (Syracuse U.)—Audiology. Audiological evaluation, Industrial/environmental audiology, Clinical supervision.

Assistant Professors

Lynn R. Cartwright, M.S. (WVU)—Speech Pathology. Parent involvement, Clinical supervision.

Robin R. Jones, M.S. (WVU)—Audiology. Aural rehabilitation, Clinical supervision.

Conrad Lundeen, Ph.D. (U. Iowa)—Audiology. Aural rehabilitation, Central auditory disorders, Clinical supervision.

Pamela R. Mitchell, M.A. (U. Wisc.)—Speech Pathology. Aphasia, Language acquisition, Clinical supervision.

Cheryl L. Prichard, M.S. (WVU)—Speech Pathology. Public school clinical programs, Clinical supervision.

Instructors

Janet J. Petitte, M.S. (WVU)—*Clinical.* Audiology. Clinical supervision.

Karen Barr Haines, M.S. (WVU)—*Clinical.* Speech Pathology. Clinical supervision.

Special Education

Professors

J. Eugene Clements, Ed.D. (U. Kans.). Behavioral disorder, Learning disabilities.

Thomas P. Lombardi, Ed.D. (U. Ariz.). Learning disabilities, Mental retardation.

Gabriel A. Nardi, Ph.D. (U. Wisc.). Behavioral disorders, Mental retardation, Geriatrics.

John S. Platt, Ed.D. (U. Kans.). Learning disabilities, Behavior disorders.

Wilfred D. Wienke, Ed.D. (U. N. Colo.)—*Program Coordinator.* Professional development in special education, Mental retardation.

Associate Professors

Louise A. Kaczmarek, Ph.D. (U. Rochester). Early childhood special education, Language development and disorders, Severe/profound handicaps.

Annette U. Shuck, Ed.D. (WVU). Mental retardation, Behavioral disorders, School psychology.

Diane T. Woodrum, Ed.D. (WVU). Mental retardation, Behavioral disorders, Learning disabilities.

Assistant Professors

Hilda Hursh, M.A. (U. Kans.)—*Research.* Early childhood, Severe and profound.

Bonnie Joyce, Ph.D. (U. Fla.)—*Research.* Applied behavior analysis, Prevention of disabilities.

Barbara L. Ludlow, Ed.D. (WVU)—*Research.* Severe handicap, Learning disabilities.

Rena F. Subotnik, Ph.D. (U. Wash.). Curriculum instruction, Gifted.

Edna R. Thompson, Ed.D. (WVU)—*Clinical.* Learning disabilities, Education administration.

Ronald K. Wolf, Ph.D. (U. Kans.)—*Research.* Learning disabilities, Administration.

Instructors

Luise B. Savage, M.S. (Westminster C.)—*Visiting.* Gifted.

Margaret N. Turner, M.A. (U. Tenn.)—*Clinical.* Learning disabilities, Mental retardation, Behavioral disorders.

Division of Education

Curriculum and Instruction

Professors

John L. Carline, Ph.D. (Syracuse U.). Curriculum, Teacher behavior, Interpersonal relations.

J. William Douglas, Ph.D. (Ohio St. U.)—*Dean, School of Physical Education.* Management theory, History and philosophy of sport.

Marilyn Fairbanks, Ph.D. (WVU)—*Program Coordinator, Reading.* Reading education, Secondary/college reading, Comprehension: process/strategies.

John P. Helfeldt, Ph.D. (Syracuse U.). Reading education, Reading and learning disabilities, Organizing reading programs.

Boyd D. Holtan, Ed.D. (U. Ill.). Mathematics education, Instructional strategies, Microcomputer education.

Ronald V. Iannone, Ed.D. (Syracuse U.). Creative drama, Aesthetic education, Alternative education.
Robert L. Kurucz, Ph.D. (Ohio St. U.)—*Adjunct.* Sport and exercise study, Exercise physiology.
Layle D. Lawrence, Ph.D. (LSU). Secondary agricultural education, Youth organization, Extension education.
C. Everett Marcum, H.S.D. (Ind. U.)—*Adjunct.* Safety management, Industrial safety.
Roy A. Moxley, Ph.D. (U. Mich.). Early childhood education, Early literacy, Educational technology.
C. Kenneth Murray, Ph.D. (Ohio St. U.)—*Program Coordinator, Secondary Education.* Social studies education, Economic education, Teacher behavior.
Cynthia S. Sunal, Ph.D. (U. Md.). Social studies education, Early childhood education, Cognitive development.
Dennis W. Sunal, Ph.D. (U. Mich.). Science education, Teacher education, Higher education.
Charles Wales, Ph.D. (Purdue U.)—*Adjunct.* Thinking skills, Decision making and guided design.

Associate Professors

Patrick E. Balch, M.A. (WVU). Science education, Investigative/inquiry instructional strategies, Gifted education—science.
W. Scott Bower, Ph.D. (Ohio St. U.). Teaching strategies, Curriculum development, Teacher effectiveness.
Ardeth M. Deay, Ph.D. (Cornell U.)—*Program Coordinator, Elementary Education.* Classroom organization and management, Rural women in education, Peace education.
Sandra Bradford DeCosta, Ed.D. (WVU). Early childhood education, General methods of education, Multicultural/global education for teachers.
Patricia A. Obenauf, Ed.D. (U. Va.). Curriculum development, Science education, Conceptual models.
Perry D. Phillips, Ed.D. (WVU)—*Division Director.* Social studies education, Teacher education.
Martin Saltz, Ph.D. (U. Conn.). Developmental reading, Corrective reading, Computer applications in language arts.
Patricia K. Smith, Ed.D. (WVU). Recreational reading, Clinical reading, Language arts.

Assistant Professors

Barbara T. Bontempo, Ed.D. (Ind. U.). Teacher preparation, English education, Alternative learning environments.
Michael A. Caruso, M.A. (WVU). Teacher education certification.
Stacy A. Gartin, Ph.D. (Ohio St. U.). Adult agricultural education, Communications, Leadership development.
Betsy M. Hobbs, Ed.D. (WVU). Content area reading, Reading motivation—children's literature, Experiential programs for adult learners.
James R. Myers, Ed.D. (WVU). Mathematics education, Microcomputers in education.
Marilynn Stanard, Ph.D. (Mich. St. U.). Student teaching, Classroom management, Teacher education.

Lecturers

Sue Day-Perroots, M.A. (WVU). Language arts education, Rural schools, Counseling and guidance.
Joy Faini Saab, M.A. (WVU). Dance, Creative drama, Early childhood education.

Education Administration

Professors

John O. Andes, Ed.D. (U. Fla.)—*Associate Dean.* Higher education law, Administration and leadership.
Laddie R. Bell, Ed.D. (U. Va.)—*Emeritus.*
Ronald Childress, Ed.D. (U. Tenn.)—*WV COGS.* Instructional management.
Wilson I. Gautier, Ed.D. (WVU)—*Emeritus.*
Neil L. Gibbins, Ph.D. (Ohio St. U.)—*Marshall U.* Staff personnel, School plant, Public school law.

Harold I. Goodwin, Ph.D. (U. Calif.). Personnel, Collective bargaining, Complex organizations.

Robert B. Hayes, Ed.D. (U. Kans.)—*Marshall U.* Higher education administration/finance/issues, Leadership.

Harry B. Heflin, Ph.D. (U. Pitt)—*Emeritus.*

Paul A. Leary, Ph.D. (U. Mass.)—*WV COGS.* Public school administration.

James A. Martin, Ed.D. (U. Tenn.). Superintendency, Business management, School law.

Richard F. Meckley, Ph.D. (Ohio St. U.). Education law, Education finance, School business administration.

Allen A. Mori, Ph.D. (U. Pitt)—*Dean of Education, Marshall U.* Higher education leadership.

Caroline Neal, Ed.D. (WVU)—*WV COGS.* Social foundations, Public school administration.

Bernard Queen, Ph.D. (Ohio St. U.). Superintendency, School principalship/finance.

Powell E. Toth, Ph.D. (Ohio St. U.)—*WV COGS.* Public school administration.

Ken M. Young, Ed.D. (VPI&SU)—*WV COGS.* School principalship, Public school administration.

Associate Professors

Ernest R. Goeres, Ph.D. (U. Iowa)—*Associate Dean.* Higher education finance, College business management, Economics of higher education.

Billy K. Gordon, Ed.D. (U. Ky.)—*Marshall U.* Supervision, General school administration.

Joann Hall, Ed.D. (VPI&SU)—*WV COGS.* Supervision, Public school administration.

Richard A. Hartnett, Ed.D. (WVU)—*Program Coordinator.* Comparative higher education, Administrative theory, Academic governance.

Olen E. Jones, Ph.D. (Northwestern U.). Higher education administration.

H. Edward Lilley, Ph.D. (Tex. A&M U.). Educational facilities, School-community relations, Principalship.

Edwin R. Smith, Ed.D. (WVU). Planning, Institutional research.

Ermel Stepp, Ed.D. (WVU)—*Marshall U.* Administrative theory, Leadership, Computers.

George D. Taylor, Ph.D. (Ill. St. U.)—*Vice President—Student Affairs.* Student personnel administration, Student development.

Rachel B. Tompkins, Ed.D. (Harvard U.)—*Associate Vice President—WVU Extension and Public Service.* Politics/economics of education, Policy analysis.

Jack E. Yeager, Ed.D. (VPI&SU)—*Dean, WV COGS.* Higher education law, Politics of education, Public school administration.

Assistant Professors

Nell C. Bailey, Ed.D. (Ind. U.)—*Dean, Student Affairs, Marshall U.* Personnel administration, Higher education.

Helen M. Hazi, Ph.D. (U. Pitt). Legal issues impacting instructional supervision.

Richard Hunt, Ph.D. (Ohio St. U.). Public school administration.

Thomas S. Sloane, Ph.D. (Ohio St. U.)—*Adjunct.* College student, Student development.

Douglas C. Smith, Ph.D. (WVU)—*Adjunct.* Public school administration, Distance education, Comparative education.

Lecturer

Marta A. Roth, Ed.D. (WVU). Special education administration, Inservice education, Interagency collaboration.

Family Resources and Health Studies Division

Family Resources (Home Economics)

Professors

Margaret J. Albrink, M.D. (Yale U.)—*Adjunct.*

Sara Ann Brown, Ph.D. (Iowa St. U.)—*Emerita.*

Mary K. Head, R.D., Ph.D. (Purdue U.)—*Division Director; Family Resources Program Coordinator.* Experimental foods, Applied human nutrition, Food and dietary evaluation.

Carl B. Taylor, Ph.D. (Penn St. U.)—*Emeritus.*
M. Zafar Alam Nomani, Ph.D. (Rutgers U.). Nutrition, Dietary fiber, Cholesterol and protein metabolism.

Associate Professors
Wanda K. Franz, Ph.D. (WVU). Human development, Cognitive development, Theory.
Babette Graf, M.S. (Penn St. U.)—*Emerita.*
Audrey G. Guthrie, M.S. (Cornell U.). Household economics and management.
Joann P. Guthrie, M.S. (WVU). Rehabilitation, Architectural barriers, Independent living.
Mary Rose Jones, M.S. (WVU)—*Emerita.*
Nora M. MacDonald, M.S. (Iowa St. U.). Apparel design, Clothing for special needs, Fashion merchandising.
Reva Belle Neely, M.E. (Colo. St. U.)—*Emerita.*
Alan R. Sack, Ph.D. (VPI&SU). Family relations, Young adult behavior patterns.
Ruth E. Weibel, M.S. (U. Tenn.). Socio-psychology of clothing, Costume history, Design.
Janice I. Yeager, M.S. (U. Ill.). Textile science, Textiles for interiors, Fashion merchandising.

Assistant Professors
Gladys R. Ayersman, M.S. (WVU)—*Emerita.*
M. Kate Clark, Ed.D. (WVU)—*Adjunct.*
Mary Cluskey, M.S. (Ill. St. U.)—*Clinical.* Institutional/experimental foods.
Wylene P. Dial, M.A. (Marshall U.)—*Adjunct.*
Shirley C. Eagan, M.Ed. (N.C. St. U.)—*Adjunct.*
William H. Hagerty, M.A. (WVU). Interior design graphics, Lighting/residential design.
Marian B. Liddell, Ed.D. (WVU). Curriculum, Instruction, Supervision.
Sally S. N. McCoy, M.S. (Fla. St. U.). Contract interior design, Space planning.
Dottie D. Rauch, M.Ed. (Penn St. U.). Family economics, Home management.
Dorothy Schusterman, M.S. (Case West. Res. U.)—*Adjunct.*
Ellen K. Smith, M.S. (WVU)—*Adjunct.*
Ngaire M. van Eck, M.A.H.E. (Mich. St. U.)—*Adjunct.*
Barbara G. Warash, M.S. (Fla. St. U.)—*Clinical.* Child development, Nursery school.

Health Studies

Professors
Bill R. Carlton, Ed.D. (U. Tenn.)—*Program Coordinator.* Social-psychology of health and illness/organizations.
R. John C. Pearson, M.D. (U. Cambridge). Epidemiology.

Associate Professor
Kenneth J. Simon, Ed.D. (Columbia U.). Program design, Research and education, Drug education.

Foundations Division

Educational Foundations

Professors
Franklin Parker, Ed.D. (G. Peabody TC)—*Benedum.* History of U.S. education, Comparative and international education, Philosophies of education.
Mary I. Yeazell, Ed.D. (U. Ill.)—*Program Coordinator.* Philosophy of education, Philosophy for children, Moral development.

Assistant Professor
Christine M. Shea, Ph.D. (U. Ill.). History of education/American education, Political economy/Social foundations of education.

Educational Psychology

Professors
Benjamin H. Bailey, Ed.D. (U. Fla.). Educational psychology/research/measurement/evaluation.

Sheldon R. Baker, Ed.D. (Case West. Res. U.). Educational psychology, Psychological testing, Research and statistical methodology.

Lawrence Fraley, Jr., Ed.D. (USC). Instructional technology, Conceptual foundations of radical behaviorism, Instructional development.

Rogers McAvoy, Ph.D. (Ind. U.). Education, Learning, Instruction.

James C. McCroskey, Ed.D. (Penn St. U.)—*Adjunct.* Communication theory/instruction/avoidance, Organizational communication.

John J. Paterson, Ed.D. (Mich. St. U.)—*Program Coordinator.* Administrative and educational services, Educational statistics/measurement.

Diane L. Reinhard, Ph.D. (Ohio St. U.)—*Dean.* Educational evaluation, Elementary education, Educational research/statistics/measurement.

Meng Shu Tseng, Ed.D. (Ind. U.). Vocational education, Multivariate statistics, Research methodology.

Ernest A. Vargas, Ph.D. (U. Pitt). Sociology, Instructional design, Verbal behavior.

Julie S. Vargas, Ph.D. (Penn St. U.). Educational psychology, Instructional design, Behavioral analysis, Microcomputers.

Richard T. Walls, Ph.D. (Penn St. U.). Educational psychology, Human learning/Problem solving, Vocational rehabilitation.

Associate Professors

John T. Grasso, Ph.D. (Ohio St. U.). Educational development, Research/Evaluation/Computers/Information systems.

Daniel E. Hursh, Ph.D. (U. Kans.). Developmental and child psychology, Personalized system of instruction, Language development.

Anne H. Nardi, Ph.D. (WVU). Psychology, Problem solving, Adult learning, Guided design.

Floyd L. Stead, Ed.D. (WVU)—*Division Director.* Education, Educational measurement/evaluation/research.

Assistant Professor

Susan M. Rodman, Ed.D. (WVU)—*Adjunct.* Computer and information systems, Statistical methods.

Technology Education

Professors

Thomas J. Brennan, Ed.D. (WVU)—*Emeritus.*

Paul W. DeVore, Ph.D. (Penn St. U.). Industrial arts and technology, Appropriate technology and community development, Transportation systems.

David L. McCrory, Ph.D. (Case West. Res. U.)—*Program Coordinator.* Curriculum studies/evaluation, Technology transfer, Professional develpment.

Associate Professors

George R. Maughan, Jr., Ed.D. (WVU). Technology education, Communication/information systems, Microcomputers.

Edward C. Pytlik, Ph.D. (Iowa St. U.). Industrial education, Production systems, Appropriate technology international.

Mark R. Skinner, Ed.D. (WVU). Technology education, Transportation systems, Alternative vehicle design.

Assistant Professor

Andrew Horton, Ed.D. (WVU)—*Visiting.* Technology education, Sustainable futures, Creative thinking.

Lecturer

Naseem Hoque, Ed.S. (Mich. St. U.). History, Women in international development, Non-formal education.

Academic Support Services

MicroComputer Lab

W. Michael Reed, Ed.D. (VPI&SU)—*Coordinator.* Computer education.

Research and Training Center

Professors

Ranjit K. Majumder, Ph.D. (U. Okla.)—*Director of Research.* Rehabilitation , Psychology
Joseph B. Moriarty, Ph.D. (Fordham U.)—*Director.* Clinical psychology.
Meng-Shu Tseng, Ed.D. (Ind. U.). Multivariate statistics, Research methodology, Educational research.
Richard T. Walls, Ph.D. (Penn St. U.). Human learning, Vocational rehabilitation.

Associate Professors

Joann L. Guthrie, M.S. (WVU)—*Adjunct Research.* Rehabilitation, Architectural barriers, Independent living.
David G. Temple, Ph.D. (U. Va.)—*Adjunct Research.* Political science.

Assistant Professors

Gordon R. Kent, Ph.D. (U. S.C.)—*Research.* Counselor education, Disabled student services, Vocational rehabilitation.
Apinya Kunjara, M.S.E.E. (WVU)—*Research.* Electrical engineering, Computer applications, System design.
George M. McGuire, Ed.D. (WVU)—*Research.* Educational psychology, Assessment and quantitative methods.
Don E. McLaughlin, M.A. (WVU)—*Research.* Computer systems design, Computer applications.
Sita Misra, Ph.D. (WVU)—*Research.* Economics of rehabilitation.

Instructors

Denetta L. Dowler, M.A. (WVU)—*Research.* Educational psychology and rehabilitation.
Deborah J. Hendricks, B.S. (WVU)—*Research.* Statistics.
Barbara T. Judy, M.A. (WVU)—*Research.* Rehabilitation, Medical and psychological aspects of disability.
Lynn Kondrot, B.S.I.E. (WVU)—*Research.* Industrial engineering, Systems analyst.
John D. Vaughn, M.S. (WVU)—*Research.* Human factors, Ergonomics.

Early, Middle Childhood, and Adolescent Education

The Early, Middle Childhood, and Adolescent Education programs prepare students for the teaching profession. Drawing upon University-wide, as well as College resources, these undergraduate programs are designed to help students to develop a broad cultural background in the arts and sciences, strong subject-matter preparation, and mastery of professional knowledge and skills that unite theory and research with professional practice.

Program advisers help students to identify their professional goals and to select congruent experiences in course work offered in Curriculum and Instruction and in other schools and colleges of the University, in clinical assignments, and in field practica off campus.

The faculty includes outstanding educators who have earned state, national, and international recognition for their professional contributions. They provide leadership at many levels of teacher education and are committed to research and scholarly inquiry to expand knowledge and to improve professional practice.

West Virginia University is fully accredited for the preparation of teachers by the National Council for the Accreditation of Teacher Education (NCATE) and by the West Virginia State Department of Education. The Doctor of Education (Ed.D.) is the highest degree approved and offered.

Three kinds of regulations/requirements must be adhered to by students in Early, Middle Childhood, and Adolescent Education: (1) Admission and Retention Requirements; (2) Graduation Requirements; and (3) West Virginia Board of Education Regulations and State Department of Education Require-

ments for Teacher Certification. Each of these is described briefly in subsequent sections, and students interested in these programs are strongly encouraged to discuss them carefully with a Teacher Education adviser.

The College of Human Resources and Education and the West Virginia Department of Education are in the process of reviewing and revising all certification programs. Students are warned that programs printed in the Catalog may not be in effect at the time of their registration and are advised to see their adviser upon arrival on campus.

Admission Into and Retention in Teacher Education

Students seeking admission into Teacher Education (Early, Middle Childhood, or Adolescent Education) may declare Education as their major upon entering the University, or they may do so at any point between their entry and their successful completion of 58 hours of approved University course work. Since formal admission into Teacher Education cannot occur until after 58 hours have been completed, those students who declare their major earlier and who meet requirements specified below are designated Pre-Education students; those who meet the general requirements described below are designated Teacher Education students.

A. General Requirements for Admission into Teacher Education

1. Completion of a minimum of 58 hours of approved University course work.

2. Achievement of a 2.25 grade-point average (GPA) computed on all approved University work attempted and a 2.25 GPA on work completed in the specialization.

3. Achievement of an acceptable level of performance, as designated by the State Department of Education and/or the College of Human Resources and Education, on the following: a. National Teacher Examination Pre-Professional Skills Tests; b. Speech and Hearing Test; c. American College Testing Program College Outcome Measures Project; and d. Microcomputer and listening competencies.

4. A written application including a statement that all general requirements for admission into Teacher Education have been met.

5. Completion of any additional requirements of specific program areas.

B. Various Admission Statuses

1. Pre-Education status, as noted above, may be achieved by declaring Education as a major. It does *not* constitute admission into the program, but it is a status that permits the student to complete any of the general requirements listed in A-3 (above). Students must achieve an acceptable level of performance on the NTE Pre-Professional Skills Tests (Mathematics, Reading, and Writing) as designated by the State Department of Education and/or the College of Human Resources and Education prior to enrolling in the professional education course sequence.

2. Full admission status is achieved by those students who meet all of the requirements in A-1 through A-5, above.

3. Provisional status may be granted transfer or graduate students who meet all of the general admission requirements listed above *except* those

included in A-3. Provisional status is granted for no more than one calendar year, and provisional status students are not eligible for student teaching.

C. Remediation Options

Students who do not meet skill/proficiency score requirements listed in A-3 may choose to avail themselves of the numerous remediation options on campus. These include the Reading Clinic, the Micro-Computer Laboratory, and the Learning Center.

D. General Retention Requirements

1. Students must maintain a 2.25 grade-point average on all hours attempted and a 2.25 GPA in their area(s) of specialization.
2. Students must achieve a grade of C or better in each professional education course.
3. Fulfillment of an additional requirements within specific program areas. Note that Music Education has unique requirements.

Graduation Requirements

To be eligible for recommendations for the degrees of Bachelor of Science in Early Education, Bachelor of Science in Middle Childhood Education, or Bachelor of Science in Adolescent Education, a candidate must:

1. Comply with the general regulations of the University concerning entrance, advanced standing, classification, examination, grades, grade points, etc.
2. Satisfy the following requirements:
   a. Complete the required courses and the minimum hours of approved courses in Education.
   b. Select and pursue subject specializations for the B.S. in Early Education, the B.S. in Middle Childhood Education, or the B.S. in Adolescent Education.
   c. Adhere to the patterns prescribed in completing the subject specialization(s).
   d. Present a minimum of 128 hours of approved college credit. A general average of 2.25, as described under "General Requirements for Certification," must be attained for the total hours. Forty-five of these hours must be upper-division courses.
   e. Complete 26 hours after enrolling in the program area of Curriculum and Instruction.
   f. Be at least 18 years of age and be intellectually, emotionally, physically, and otherwise qualified to perform the duties of a teacher.

Since requirements for teacher certification may be changed between *Catalog* printings, completion of programs as they appear in this edition is not guaranteed to result in eligibility for a professional certificate. Up-to-date information related to certification can be obtained from the Office of Student Advising and Records, 807 Allen Hall.

General Requirements for Professional Certification

The individual candidate applies for professional certification.

To teach in the public schools of West Virginia, one must hold a professional certificate issued by the West Virginia Department of Education. To be eligible to receive a professional certificate, the WVU applicant:

1. Must have met the minimum state requirements.
2. Must have met the University degree requirements.
3. Must have completed at least 45 hours of upper-division work (WVU standards).
4. Must have achieved a grade-point average of at least 2.25:
   a. On the total of college credits earned.
   b. On the hours earned in professional education.
   c. In student teaching supervised by WVU supervisor(s) [includes Performance Assessment].
   d. In each subject specialization.
5. Must have met state or College of Human Resources and Education requirements on the Pre-Professional Skills Test and requirements for the content specialization test(s) in the area(s) for which certification is sought.
6. Must have complied with the West Virginia Board of Education Regulation for Teacher Certification.
7. Must have been recommended for certification by the Dean of the College of Human Resources and Education.
8. Must be U.S. citizen or, if not, have filed a declaration of intent to become a U.S. citizen.

West Virginia Board of Education Regulation for Teacher Certification

The West Virginia Board of Education requires that 100 of the 128 semester hours required for certification shall be completed in regularly scheduled campus courses. The 28 hours of permissible nonresidence courses may be earned by off-campus study, home study (correspondence), radio, television, special examination, and/or military service.

Reciprocal Certification Agreements

West Virginia, at the time of this publication, has reciprocal agreements with certain other states for teacher certification. Inquiries about reciprocity should be directed to the Office of Student Advising and Records, 807 Allen Hall.

Calculation of Grade-Point Averages

The West Virginia State Department of Education's system of calculating grade-point averages for certification purposes differs in some respects from the WVU system. For certification, all course work attempted at WVU and at other institutions of collegiate rank will be considered. If a student earns a grade of D, F, or U in any course taken no later than the term when he or she has attempted a total of 60 hours, and the student repeats this course, the second grade earned will be used in determining the grade-point average. The first grade will be disregarded.

The Division of Education uses the West Virginia State Department of Education system of calculating grade-point averages only for admission to Teacher Education programs, admission to student teaching, and for assessing teaching field and education averages. Academic performance and eligibility for graduation are assessed by the system used by WVU and Board of Regents institutions.

Planning a Course of Study for Certification

Assistance in planning a course of study to meet certification requirements is available upon request in the Teacher Education Advising Center of the College of Human Resources and Education. Before the end of their second year of study, students who wish to become teachers should arrange a planning conference.

The College of Human Resources and Education and the West Virginia Department of Education are in the process of reviewing and revising all certification programs. Students are warned that programs printed in the Catalog may not be in effect at the time of their registration and are advised to see their adviser upon arrival on campus.

PROGRAMS FOR EARLY AND MIDDLE CHILDHOOD EDUCATION

Requirements for Degree of Bachelor of Science in Early and Middle Childhood Education and for Recommendation for Professional Certificate, Grades K–8, Pre K–K, 5–8, and Endorsements Attached to Multi-Subjects Certification

Lower-Division Work

In their freshman and sophomore years, students who want to be admitted into Teacher Education and to prepare for teaching at the early and middle childhood levels should register in the Pre-Education program of the College of Human Resources and Education should pursue the program of general education prescribed by the State Board of Education for all students seeking recommendations for teaching certificates. This program of prescribed work is included in the "Program for Undergraduate Early and Middle Childhood Education." It is strongly recommended that students complete the required lower-division courses during their first two years so that the greatest possible number of hours taken in the junior and senior years will carry upper-division credit.

Upper-Division Work

For admission to the prescribed courses in Early and Middle Childhood Education, students must register for the final two years in the Division of Education. The following are required:

1. Successful completion of 58 hours of approved college work.
2. A grade-point average of 2.25 on all work attempted in order to enroll in student teaching.
3. Completion of all prerequisites for C&I 100, 130, 140, 150, and Rdng. 240 prior to entrance into these courses.

To become eligible for recommendation for the degree of Bachelor of Science in Education and the Professional Certificate, Grades K-8, the student must complete the required curriculum and plan of work with a grade-point average of 2.25 on all hours attempted and in the area(s) of specialization and a grade of C or better in each professional education course, including student teaching; the student must also have been enrolled in the Division of Education for at least 30 hours of work, including a minimum of 12 hours in student teaching.

PROGRAMS FOR UNDERGRADUATE EARLY AND MIDDLE CHILDHOOD EDUCATION
GRADES K-8, Pre K-K, K-12, and 5-8 Endorsements Attached to Multi-Subjects
GENERAL ACADEMIC CONCENTRATION
(128 Semester Hours Required)

All Early and Middle Childhood students must complete requirements for the Multi-Subjects K-8 Program. It is recommended that the Professional Certificate, Grades K-8, be endorsed with an appropriate specialization selected from the options listed below.

Specializations for Grades 5-8
French
Spanish
Oral Communication
Language Arts
Mathematics
Science
Social Studies
Specializations for K-12
Mentally Impaired
Library/Media
Specializations for Pre-K
Pre-K

Students who do not select a specialization must complete 8 credit hours of elective course work in order to meet the minimum requirement of 128 hours for graduation.

The 120 hours of required course work and the elective options for the Early and Middle Childhood Multi-Subjects program are presented below.

MULTISUBJECTS GRADES K-8
(128 Semester Hours Required)

	Required Sem. Hr.
GENERAL STUDIES REQUIREMENTS (K-4 and 5-8)	70
GENERAL	19
Engl. 1—Composition and Rhetoric	3
Engl. 2—Composition and Rhetoric	3
L. Sci. 203—Literature for Children	3
Music 41—Fundamental Music Skills	2
Music 42—Teaching Elementary School Music	2
Hl. Ed. 101—Elementary School Health Program	2
G.P.E. 41—Movement Education and Rhythms	1
G.P.E. 42—Elementary Sports Skills	1
P.P.E. 43—Physical Education for Elementary Teachers	2
CORE A	12
Art 3—Materials and Procedures	3
Engl. 35—Poetry and Drama, or Engl. 36—Short Story and Novel	3
Art 30—Appreciation of Visual Arts, or Music 30—Introduction to Music, or Theat. 30—Appreciation of Theatre	3
Core A elective	3
CORE B	18
Soc. & A. 5—Introduction to Anthropology, or Soc. & A. 51—World Cultures	3
Hist. 1—Western Civilization: Antiquity to 1600	3
Hist. 52—Growth of the American Nation to 1865	3
Hist. 53—Making of Modern America, 1865 to the Present	3
Hist. 153—West Virginia, or Hist. 261—Economic and Social Development of West Virginia	3
Geog. 7—Physical Geography	3

	Required Sem. Hr.
CORE C	21
P. Sci. 1—Introductory General Course	4
P. Sci. 2—Introductory General Course	4
Biol. 1—General Biology, and Biol. 3—General Biology Lab, *or* Biol. 2—General Biology, and Biol. 4—General Biology Lab	4
Math. 33—Introductory Mathematics for Elementary Teachers	3
Math. 34—Introductory Mathematics for Elementary Teachers	3
Math. 131—Algebra and Geometry for Elementary Teachers	3
PROFESSIONAL EDUCATION	50
GENERAL	20
C&I 7—Introduction to Education	2
Ed.P. 103—Human Development and Learning	3
Ed.D. 105—Human Growth and Development	3
C&I 120—Elementary Early/Middle Childhood Language Arts	3
Rdng. 221—Developmental Reading	3
C&I 210—Early Childhood Education 1	3
C&I 211—Early Childhood Education 2	3
PRE-STUDENT TEACHING BLOCK	15
C&I 100—Elementary Early/Middle Childhood General Methods	3
C&I 130—Elementary Early/Middle Childhood Mathematics	3
C&I 140—Elementary Early/Middle Childhood Science	3
C&I 150—Elementary Early/Middle Childhood Social Studies	3
Rdng. 240—Corrective Language Arts Techniques	3
STUDENT TEACHING SEMESTER	15
C&I 187—Student Teaching Elementary Early Childhood, *and*	12
C&I 280—Special Problems: Student Teaching Seminar, *or*	3
C&I 187—Student Teaching Elementary Early Childhood, *and*	6
Sp. Ed. 280—Student Teaching Clinical Experience: Special Education, and	6
C&I 280—Special Problems: Student Teaching Seminar	3

SPECIALIZATION FOR EARLY EDUCATION Pre-K-K ENDORSEMENT ON K-8 MULTI-SUBJECTS

Required Courses	19-20
CDFS 112—Toddler and Preschool Development	3
CDFS 216—Child Development Practicum	3-4
C&I 210 and 211—Early Childhood Education*	6
C&I 214—Creative Experiences in Early Childhood *or* Theat. 282—Creative Dramatics	3
G.P.E. 40—Early Childhood Activities	1
SPA 250—Speech-Language-Hearing: Development-Disorders	3

*Required for Multi-Subjects Program.

SPECIALIZATION FOR GRADES 5 THROUGH 8

FOREIGN LANGUAGES—GRADES 5-8

French—Grades 5-8

Required Courses	27
Frch. 1, 2—Elementary French	6
Frch. 3, 4—Intermediate French	6

	Required Sem. Hr.
Frch. 103, 104—Advanced French	6
Frch. 217—French Civilization, *or*	
Frch. 292—Pro-Seminar: French Culture	3
Frch. 231—Pronunciation and Phonetics	3
Lang. 221 (C&I 125)—The Teaching of Foreign Languages	3

Spanish—Grades 5-8

Required Courses	27
Span. 1, 2—Elementary Spanish	6
Span. 3, 4—Intermediate Spanish	6
Span. 103, 104—Advanced Spanish	6
Span. 116—Spanish Civilization and Culture	3
Span. 292—Pro-Seminar: Latin American Culture	3
Lang. 221 (C&I 125)—The Teaching of Foreign Languages	3

HOME ECONOMICS (Consumer and Homemaking)—Grades 5-8	34
Required Courses	
Tx&Cl 124—Apparel Construction and Fitting	3
Tx&Cl 27—Introductory Textiles	3
Tx&Cl 121—Clothing for the Family	3
FIA 55—Food Principles and Practices	4
CD&FS 112—Toddler and Preschool Development	3
CD&FS 211—Middle Childhood-Early Adolescent Development	3
HM&FE 161—Family Economics	3
ID&H 33—Housing Design	3
Nutrn. 71—Introduction to Human Nutrition	3
H.E.Ed. 278—Vocational Home Economics	3
H.E.Ed. 175—Methods of Teaching Home Economics	3

LANGUAGE ARTS—Grades 5-8	40
Required Courses	
Engl. 1—Composition and Rhetoric*	3
Engl. 2—Composition and Rhetoric*	3
Engl. 35—Poetry and Drama, *or*	
Engl. 36—Short Story and Novel*	3
Rdng. 221—Developmental Reading*	3
L. Sci. 203—Literature for Children*	3
Engl. 111—The English Language	3
Engl. 170—Modern Literature 1	3
Engl. 171—Modern Literature 2	3
L. Sci. 205—Young Adult Literature, *or*	
Engl. 294—Fiction for Adolescents	3
Rdng. 240—Corrective Language Arts Techniques*	3
Engl. 295—Approaches to Teaching Composition	3
C&I 224—Approaches to Teaching Language	2
C&I 225—Approaches to Teaching Literature	2
C&I 120—Elementary-Early Childhood Language Arts*	3

*Required for Multi-Subjects Program.

MATHEMATICS—Grades 5-8	21-24
Required Courses	
C&I 337—Mathematics in the Junior High School	3
Math. 33—Introductory Mathematics for Elementary Teachers*	3
Math. 34—Introductory Mathematics for Elementary Teachers*	3
Math. 131—Algebra and Geometry for Elementary Teachers*	3

*Required for Multi-Subjects Program.

	Required Sem. Hr.
Math. 226—Mathematical Statistics	3
Math. 128—Introduction to Calculus	3
Math. 14—Pre-Calculus Mathematics, or	3
Math. 3—College Algebra, *and*	3
Math. 4—Plane Trigonometry	3

ORAL COMMUNICATION—Grades 5-8

Required Courses	21
Spch. 11 and 12—Principles of Human Communication and Human Communication in the Interpersonal Context	3
Spch. 80—Introduction to the Mass Media	3
Spch. 106—Nonverbal Communication	3
SPA 80—Speech Improvement	3
SPA 250—Speech-Language-Hearing: Development-Disorders	3
Theat. 50—Oral Interpretation	3
Theat. 282—Creative Dramatics (May substitute Theat. 180 or 284)	3

SCHOOL LIBRARY MEDIA—Grades 5-8 24

Required Courses

L. Sci. 201—Reference and Bibliography	3
L. Sci. 203—Literature for Children*	3
L. Sci. 205—Young Adult Literature	3
L. Sci. 222—Field Practice	3
L. Sci. 223—Cataloging for Classification	3
L. Sci. 250—Managing School Library Media Centers	3
L. Sci. 291—Advanced Studies	3
T.E. 372—Development of Instructional Materials	3

*Required for Multi-Subjects Program.

SCIENCE—Grades 5-8 ..... (minimum) 24

Required Courses

P. Sci. 1—Introductory General Course*	4
P. Sci. 2—Introductory General Course*	4
Biol. 1—General Biology, and Biol. 3—General Biology Lab	4
Biol. 2—General Biology, and Biol. 4—General Biology Lab	4
Geol. 1—Physical Geology	3
Geol. 2—Physical Geology Laboratory	1

Electives ..... (minimum) 4

Chem. 11, 12—Survey of Chemistry, or Biol. 252—Flora of West Virginia, or Phys. 1, 2—Introductory Physics, or Astro. 106—Descriptive Astronomy

*Required for Multi-Subjects Program. Note that either Biol. 1 and 3 or Biol. 2 and 4 are required for Multi-Subjects; all are required for Science specialization.

SOCIAL STUDIES—Grades 5-8 33

Required Courses

Econ. 54—Principles of Economics	3
Geog. 7—Physical Geography*	3
Geog. 8—Human Geography	3
Hist. 1—Western Civilization: Antiquity to 1600*	3
Hist. 2—Western Civilization: 1600 to the Present	3
Hist. 52—Growth of the American Nation to 1865*	3

*Required for Multi-Subjects Program.

	Required Sem. Hr.
Hist. 53—Making of Modern America, 1865 to the Present*	3
Hist. 153—West Virginia,* or	
Hist. 261—Economic and Social Development of West Virginia	3
Pol. S. 2—The American Federal System	3
Soc. & A. 1—Introduction to Sociology, or	
Soc. & A. 102—Social Problems	3
Soc. & A. 5—Introduction to Anthropology,* or	
Soc. & A. 51—World Cultures	3

*Required for Multi-Subjects Program.

MENTALLY IMPAIRED (MILD AND MODERATE)—Grades K-12

Required Courses	15
Sp. Ed. 250—Survey of Exceptional Children and Adults	3
Sp. Ed. 255—Introduction to Mental Retardation	3
Sp. Ed. 260—Curriculum and Methods for Special Education	3
Sp. Ed. 281—Special Problems and Workshop	
SPA 250—Speech-Language-Hearing: Development-Disorders	3

Students who wish to be certified to teach mentally impaired children and youth will earn 6 hours of student teaching at the elementary level and 6 hours in a program for the mentally impaired. *(See Professional Education requirements.)*

PROGRAMS FOR MIDDLE AND ADOLESCENT EDUCATION

1. GENERAL STUDIES REQUIREMENTS	45-46
Note: Electives must be selected from University-approved Core classes.	
GENERAL	10
Engl. 1—Composition and Rhetoric	3
Engl. 2—Composition and Rhetoric	3
Hl. Ed. 102—Secondary School Health Program	2
General Physical Education	2
CORE A	12
Literature elective	3
Appreciation or Survey of Fine Arts elective	3
Religion, Philosophy, Humanities, Composition, Linguistics, Foreign Language elective	3
Core A elective	3
CORE B	12
History elective	3
Multidisciplinary Studies, Sociology/Anthropology, Social Science elective	3
Core B electives	6
CORE C	11-12
Note: Students must have at least one course in Mathematics and one course in Science.	
Mathematics electives	3-9
Science electives	3-9

	Required Sem. Hr.
2. PROFESSIONAL EDUCATION—MIDDLE AND ADOLESCENT	
Required Courses	32-35
Foundation for Teaching	8
C&I 7—Introduction to Education	2
Ed. P. 103, 105—Human Development and Learning	6
Teaching Methods in Area of Specialization (To be scheduled with General Methods (below) and completed before student teaching semester.)	3-6
Select those related to teaching field:	
C&I 124—Teaching Language Arts: Secondary School	3
C&I 134—Teaching Mathematics: Secondary School	3
C&I 144—Teaching Science: Secondary School	3
C&I 154—Teaching Social Studies: Secondary School	3
Ag. Ed. 160 (C&I 160)—Methods of High School Teaching of Agr.	3
Art 165 (C&I 165)—Art Education in the Elementary School	3
Art 166 (C&I 166)—Art Education in the Secondary School	3
H.E.Ed. 175 (C&I 175)—Methods of Teaching Home Economics	3
H.E.Ed. 278 (C&I 278)—Vocational Home Economics	3
Lang. 221 (C&I 125)—The Teaching of Foreign Languages	3
Music 151 (C&I 167)—Music Education	3
Music 152 (C&I 168)—Music Education	3
P.P.E. 126—Physical Education, Grades K-6	4
P.P.E. 133 (C&I 174)—Physical Education, Grades 7-12	5
Spch. 201—Principles of Communication Education	3
Saf. S. 151—Driver and Highway Safety Fundamentals	3
General Methods	6
C&I 104—Principles of Teaching in Secondary Schools	4
Rdng. 222—Reading in the Content Areas	2
Practicum	15
Select according to teaching level and fields:	
C&I 188—Secondary Student Teaching	12
C&I 187 *and* C&I 188—Elementary *and* Secondary Student Teaching (6 hours each)	12
C&I 188 *and* Sp. Ed. 280—Secondary Student Teaching *and* Special Education Student Teaching (6 hours each)	12
C&I 280—Workshop Problems—Student Teaching	3
3. TEACHING FIELDS—Grades 5-8, 5-12, and K-12 VOCATIONAL AGRICULTURE—Grades 5-12 (Single Teaching Field)	45
Required Courses—Core Program*	28
Ag. Ec. 104—Farm Management	3
Ag. Ed. 162—Group Organization and Leadership	2
Agr. M. 120—Shop Theory and Methods	4
Agr. M. 230—Farm Structures, *or* Agr. M. 240—Agricultural Engines, *or* Agr. M. 260—Advanced Farm Marchinery, *or* Agr. M. 270—Electricity in Agriculture	3
A&VS 51—Principles of Animal Science	4
Pl. Sc. 52—Principles of Plant Science	4
Agron. 2—Principles of Soil Science, *or*	4
Agron. 10—Forest Soils	3
Selected Agricultural Electives**	4-5

*Substitutions for core program courses may be made, if necessary, with equivalent courses and credit hours.

**Electives, to be selected in consultation with adviser, are based on individual student needs.

Credit hours selected from among available courses, in consultation with adviser, based on individual student needs.

Required Sem. Hr.

Agricultural Minors (select one):

Agricultural Production and Management 17
Courses selected from among the following:***
An. Nu. 101, 294; An. Ph. 100, 225, 226; An. Pr. 108, 137, 138, 139, 141, 142, 144, 145, 146, 240; F. Sci. 134, 166; Vet. Sci. 102; For. 140; F. Man. 132; Agron. 210, 212, 251, 252, 254; Gen. 171; Ento. 204, 212; Hort. 107, 115, 117, 204, 242, 245, 246; Pl. Path. 201; Ag. Ec. 200, 206, 231, 235, 240; Ag. M. 230, 240, 260, 270; A&VS 180; Pl. Sc. 180; Res. M. 1, 180; Ag. Ed. 264; Ag. 200; Ag. & For. 295.

Animal Processing 17
Courses selected from among the following.***
Fd. Sc. 107, 112, 130, 134, 166, 167, 267; Vet. Sci. 102; Ag. Micro. 141; An. Pr. 138, 139, 141, 142, 145, 146, 240; A&VS 180; Res. M. 1, 180; Ag. Ec. 231, 235; Ag. Ed. 264; Ag. & For. 295.

Agricultural Mechanics 17
Courses selected from among the following:***
Agr. M. 120, 220, 230, 240, 260, 270; I.E. 7, 8; Res. M. 180; Ag. Ed. 264; Ag. & For. 295.

Agricultural Sales and Services 17
Courses selected from among the following:***
Ag. & For. 295; Ag. Ec. 10, 200, 231, 235, 240, 261, 330; Ag. Ed. 264; Ag. M. 240, 260; Mrktg. 111, 120; Res. M. 1, 180.

Conservation 17
Courses selected from among the following:***
F. Man. 12, 122, 132, 151, 211; For. 140; F. Hyd. 243; Rc. & Pk. 56, 142, 251; Agron. 115, 210, 212, 250; L. Arc. 229; Biol. 51; Wd. Sc. 121, 123, 132; Pl. Sc. 180; Res. M. 180; Ag. Ed. 264; Ag. & For. 295; Ento. 152, 212; Pl. Path. 153; Ag. Ec. 200; Ag. M. 240, 260; Res. M. 1; W. Man. 131.

Horticulture Produce Industry 17
Courses selected from among the following:***
Hort. 107, 115, 117, 204, 242, 243, 244, 245, 246; Pl. Path. 201; Ento. 204, 212; Pl. Sc. 180, 200, 201; Ag. M. 230, 260, 270; Res. M. 1, 180; Ag. Ed. 264; Ag. & For. 295.

Ornamental Horticulture 17
Courses selected from among the following:***
Hort. 107, 116, 151, 162, 204, 245; Agron. 210, 250, 251; L. Arc. 40, 41, 229; Ento. 204, 212; Pl. Path. 201; Ag. M. 230, 240, 260, 270; Pl. Sc. 180; Res. M. 1, 180, Ag. Ed. 264; Ag. & For. 295.

ART—Grades K-12 (Single Teaching Field) 60

Required Courses

Art 11, 12—Drawing 6
Art 121, 122—Visual Foundation 6
Art 113—Painting 3
Art 100—Directed Art Studies (Studio) 3
Art 126—Sculpture 3
Art 100—Directed Art Studies (Studio), *or*
Art 200—Directed Art Studies (Studio) 3
Art 130—Printmaking *or* Art 140—Ceramics 3
Art 131—Printmaking *or* Art 141—Ceramics 3
Art 200—Directed Art Studies (Studio) 3
Art 165—Art Education in the Elementary School 3
Art 166—Art Education in the Secondary School 3

***Credit hours selected from among available courses, in consultation with adviser, based on individual student needs.

	Required Sem. Hr.
Art 211—Figure Drawing	3
Art 200—Directed Art Studies (Art Education)	3
Art 200—Directed Art Studies (Studio elective)	9
Art 105—Survey of Art	3
Art 106—Survey of Art	3
ATHLETIC TRAINING—Grades 5-12 (To be combined with another teaching field)	36
(This is an experimental program previously listed.)	
P.P.E. 121—Sport Injury Control and Management	3
S.E.S. 164—Kinesiology	3
S.E.S. 165—Physiology of Motor Activities	3
P.P.E. 176—Adapted Program in Physical Education	2
P.P.E. 220—Advanced Athletic Training 1	3
P.P.E. 221—Advanced Athletic Training 2	3
P.P.E. 222—Advanced Athletic Training 3	3
P.P.E. 223—Athletic Training Practice	3
P.P.E. 219—Human Anatomy	3
P.P.E. 324—Issues in Athletic Training	3
Saf. S. 70—First Aid and Emergency Care	3
Physi. 141—Elementary Physiology, *or*	
Biol. 166—Human Physiology, or	
Physi. 241—Homeostatic Mechanisms of Body Function	4
ENGLISH—Grades 5-12 (Single Teaching Field)	50
Lingu. 1—Introduction to Language	3
Engl. 1, 2—Composition and Rhetoric	6
Engl. 21, 22—English Literature Surveys	6
Engl. 24, 25—American Literature Surveys	6
Engl. 108—Advanced Composition (specially designated section)	3
Engl. 111—The English Language	3
Engl. 125—World Literature	3
Engl. 293—Practicum in Teaching Composition	1
Engl. 294—Fiction for Adolescents	3
Engl. 295—Approaches to Teaching Composition	3
Two 3-hour electives in English	6
C&I 224—Approaches to Teaching Language	2
C&I 225—Approaches to Teaching Literature	2
Approved elective in regional, ethnic, or minority literature	3
FOREIGN LANGUAGES—Grades 5-12	
FRENCH—Grades 5-12 (Single Teaching Field)	36
Required Courses	
Frch. 1, 2—Elementary French	6
Frch. 3, 4—Intermediate French	6
Frch. 103, 104, 109, 110—Advanced French	12
Frch. 111—French Lit. from Middle Ages to Eighteenth Century	3
Frch. 112—La Lit francaise de Louis XV a de Gaulle	3
Frch. 217—French Civilization, *or*	
Frch. 292—Pro-Seminar; French Culture	3
Frch. 231—Phonetics and Pronunciation, or	
Lingu. 247—Structure of Modern French	3

	Required Sem. Hr.
GERMAN—Grades 9-12 (To be combined with another teaching field)	36
Required Courses	
Ger. 1, 2—Elementary German	6
Ger. 3, 4—Intermediate German	6
Ger. 103, 104, 109, 110—Advanced German	12
Ger. 111—German Literature to 1832	3
Ger. 112—German Literature Since 1832	3
Ger. 265—German Civilization, *or* Ger. 292—Pro-Seminar: German Culture	3
Lingu. 111—Introduction to Structural Linguistics, *or* Lingu. 257—Structure of German	3
RUSSIAN—Grades 9-12 (To be combined with another teaching field)	36
Required Courses	
Russ. 1, 2—Elementary Russian	6
Russ. 3, 4—Intermediate Russian	6
Russ. 103, 104, 109, 110—Advanced Russian	12
Russ. 144, 145—Survey of Russian Literature	6
Russ. 292—Pro-Seminar: Russian Culture	3
Lingu. 111—Introduction to Structural Linguistics, *or* Lingu. 267—Structure of Russian	3
SPANISH—Grades 5-12 (Single Teaching Field)	36
Required Courses	
Span. 1, 2—Elementary Spanish	6
Span. 3, 4—Intermediate Spanish	6
Span. 103, 104, 109—Advanced Spanish	9
Span. 116—Spanish Civilization and Culture	3
Span. 117 and 118 or Span. 121 and 122	6
Span. 292—Pro-Semniar: Latin American Culture	3
Lingu. 111—Introduction to Structural Linguistics, *or* Lingu. 217—Structure of Spanish	3
LATIN—Grades 5-12 (Single Teaching Field)	36
Required Courses	
Class. 1, 2—Elementary Latin	6
Class. 3—Intermediate Latin	3
Class. 4—Cicero's Orations	3
Class. 101—Greek and Roman Civilization and Culture	3
Class. 102—Greek and Roman Myths	3
Class. 109—Selections from Roman Prose	3
Class. 110—Selections from Roman Poetry	3
Lingu. 111—Introduction to Structural Linguistics	3
Approved Electives (Select three: Class. 201, 202, 235, 292)	9
HOME ECONOMICS—Grades 5-12 (Single Teaching Field)	53
Required Courses (Core)	15
CD&FS 12—Introduction to Marriage and the Family	3
Tx.&Cl. 124—Apparel Construction and Fitting, *or*, Tx.&Cl. 224—Flat Pattern Design	3
Nutrn. 71—Introduction to Nutrition	3
HM&FE 165—Home Management: Principles and Applications	3
ID&H 31—Introduction to Design	3

	Required Sem. Hr.
Required Courses	38
CD&FS 112—Toddler and Preschool Development	3
CD&FS 211—Middle Childhood-Early Adolescent Development	3
CD&FS 214—Family Development	3
Tx.&Cl. 27—Introductory Textiles	3
Tx.&Cl. 121—Clothing for the Family	3
FIA 55—Food Principles and Practices	4
FIA 151—Meal Management	4
HM&FE 161—Family Economics	3
HM&FE 167—Household Equipment	3
HM&FE 261—Consumer Economics	3
ID&H 33—Housing Design	3
H.E.Ed. 278—Vocational Home Economics	3
JOURNALISM—Grades 9-12 (To be combined with another teaching field)	23
Required Courses	23
Journ. 1—Introduction to Mass Communications	3
Journ. 15—Basic Journalistic Writing	2
Journ. 18—News Writing	3
Journ. 19—Copy Editing and Make-up	3
Journ. 113—Principles of Advertising	3
Journ. 120—Introduction to Photography	3
Journ. 225—High School Publications Advising	3
Journ. 227—History of Journalism	3
MATHEMATICS—Grades 5-12 (Single Teaching Field)	30
Required Courses	24
Math. 15, 16—Calculus	8
Math. 17—Applied Mathematics	4
Math. 133—Introductory Algebra for Teachers	3
Math. 138—Modern Geometry for Teachers	3
Math. 143—Introduction to Linear Algebra, *or* Math. 241—Applied Linear Algebra	3
Math. 226—Mathematical Statistics	3
Approved Electives	6
Math. 113—Differential Equations	3
Math. 120 *or* C.S. 120—Discrete Mathematics	3
Math. 163—Introduction to Concepts of Mathematics	3
Math. 168—History of Mathematics	3
Math. 181—Introduction to Analysis and Topology	3
Math. 215—Applied Modern Algebra	3
Math. 239—Elementary Number Theory	3
Math. 251—Introduction to Real Analysis	3
Math. 252—Introduction to Real Analysis	3
Math. 291—Theory of Probability	3
C.S. 1—Introduction to Computer Science	4
MUSIC—Grades K-12 (Single Teaching Field)	64-67
(Program outline also listed under Division of Music.)	
Required Courses	
Music 31, 33, 34—Music Listening, Music Literature	7
Music 44-47 (Instrumental Majors) *or* Music 48 (Vocal Majors)	3-8
Music 51, 52, 53—Conducting	6

Required Sem. Hr.

Music 61-68—Music Theory 16
Music 100-105—Major Performance Groups 4-5
(For instrumental emphasis majors, 5 hours must be in either Music 11, Band, or Music 103, Symphony Orchestra. For wind and percussion majors 1 hour must be in marching band. For vocal emphasis majors, 4 hours must be in either Music 102, Choral Union, or Music 105, Choir.)
Music 110—Applied Music (major performance medium) 12
(Students must achieve proficiency level 7)
Music 110—Applied Music (secondary voice and piano) 4-6
(Vocal emphasis majors must achieve proficiency level 3 in voice and proficiency level 3 in piano. Instrumental emphasis majors must achieve proficiency level 2 in piano.)
Music 151, 152 (C&I 167, 168)—Music Education 6
Music 248—Music Arranging for Public School Groups 2
Required of Vocal Emphasis Majors Only
Music 49—Vocal Pedagogy 2
Required of Instrumental Emphasis Majors Only
Music 115—Chamber Music 1

ORAL COMMUNICATION—Grades 5-12 (To be combined with another teaching field) 37

Required Courses
Spch. 11 and 12—Principles of Human Communication and Human Communication in the Interpersonal Context 3
Spch. 80—Introduction to the Mass Media 3
Spch. 106—Non-Verbal Communication or Spch. 131—Human Communicaion and Language Behavior 3
Spch. 107—Human Communication and Rational Decisions 3
Spch. 133—Interpersonal Communication 3
Spch. 180—Effects of Mediated Communication 3
Spch. 201—Principles of Communication Education 3
SPA 250—Speech-Language-Hearing: Development-Disorders 3
Theat. 50—Oral Interpretation, *or*
SPA 80—Speech Improvement: Theory and Performance 3
Theat. 74—Acting 3
Theat. 100—Fundamentals of Technical Theatre 4
Theat. 180—Directing 3

PHYSICAL EDUCATION—Grades K-12 (Single Teaching Field) 45-46

(Students who wish to be certified in Physical Education, Grades K-12, will do student teaching at the elementary and the secondary levels.)

Theory and Foundations 32
P.P.E. 67—Introduction to Physical Education 3
P.P.E. 75—Motor Learning and Development 2
P.P.E. 109—Early Childhood Activities 2
P.P.E. 110—Middle Childhood Activities 2
P.P.E. 121—Sport Injury Control and Management 3
P.P.E. 126—Implementing Physical Education Programs, K-8 4
P.P.E. 133—Physical Education in Grades 7-12 5
P.P.E. 176—Adapted Program in Physical Education 2
S.E.S. 71—Sport in American Society, or
S.E.S. 72—Psychological Perspectives in Sport 3
S.E.S. 164—Kinesiology 3
S.E.S. 165—Physiology of Motor Activities 3

	Required Sem. Hr.
Psychomotor—Sport and Movement Analysis	13-14
Team and Individual Sports	8
Student must elect 4 of the following 6 courses:	
P.P.E. 45—Football, Baseball, Softball	
P.P.E. 46—Volleyball, Soccer, Speedball	
P.P.E. 47—Basketball, Field Hockey, Team Handball	
P.P.E. 48—Tennis, Badminton, Golf	
P.P.E. 49—Archery, Bowling, Fencing	
P.P.E. 50—Wrestling, Weight Training, Track and Field	
Aquatics	1 or 2
Student must elect 1 of the following 3 courses:	
P.P.E. 57—Aquatics	
P.P.E. 59—Synchronized Swimming	
P.P.E. 124—Water Safety Instructorship	
Dance	2
Student must elect 1 of the following 4 courses:	
Dance 35—Theory and Practice of Modern Dance Techniques	
Dance 37—Advanced Dance Techniques with Principles of Choreography	
Dance 38—Dance Composition	
Dance 39—Folk and Ballroom Dance	
Gymnastics	2
Student must elect 1 of the following 2 courses:	
P.P.E. 65—Gymnastics	
P.P.E. 66—Advanced Gymnastics	
PHYSICAL EDUCATION—Grades 5–8 and 9–12 (Single Teaching Field)	45-46
(Students who wish to be certified in Physical Education, Grades 5-8 and 9-12, will do student teaching at both levels.)	
Theory and Foundations	30
P.P.E. 67—Introduction to Physical Education	3
P.P.E. 75—Motor Learning and Development	2
P.P.E. 110—Middle Childhood Activities	2
P.P.E. 121—Sport Injury Control and Management	3
P.P.E. 126—Implementing P.E. Programs, K-8	4
P.P.E. 133—Physical Education in Grades 7-12	5
P.P.E. 176—Adapted Program in Physical Education	2
S.E.S. 71—Sport in American Society, or	
S.E.S. 72—Psychological Perspectives in Sport	3
S.E.S. 164—Kinesiology	3
S.E.S. 165—Physiology of Motor Activities	3
Psychomoter—Sport and Movement Analysis	15-16
Team and Individual Sports	10
Student must elect 5 of the following 6 courses:	
P.P.E. 45—Football, Baseball, Softball	
P.P.E. 46—Volleyball, Soccer, Speedball	
P.P.E. 47—Basketball, Field Hockey, Team Handball	
P.P.E. 48—Tennis, Badminton, Golf	
P.P.E. 49—Archery, Bowling, Fencing	
P.P.E. 50—Wrestling, Weight Training, Track and Field	
Aquatics	1 or 2
Student must elect 1 of the following 3 courses:	
P.P.E. 57—Aquatics	
P.P.E. 59—Synchronized Swimming	
P.P.E. 124—Water Safety Instructorship	

	Required Sem. Hr.
Dance	2
Student must elect 1 of the following 4 courses:	
Dance 35—Theory and Practice of Modern Dance Techniques	
Dance 37—Advanced Dance Techniques with Principles of Choreography	
Dance 38—Dance Composition	
Dance 39—Folk and Ballroom Dance	
Gymnastics	2
Student must elect 1 of the following 2 courses:	
P.P.E. 65—Gymnastics	
P.P.E. 66—Advanced Gymnastics	

SAFETY STUDIES—Grades 9-12 (To be combined with a 9-12 or K-12 specialization) 18

Required Courses

Saf. S. 70—First Aid and Emergency Care	3
Saf. S. 131—Accident Prevention and Control Principles	3
Saf. S. 151—Driver and Highway Safety Fundamentals	3
Saf. S. 231—Safety on Motor Transporation Sciences, *or* Saf. S. 232—Safety Education Principles and Content	3
Saf. S. 254—Teaching Driver and Highway Safety	3
Saf. S. 256—Driver and Safety Instructional Innovations	3

SCHOOL LIBRARIAN—Grades K-12 (To be combined with another teaching field) 24

Required Courses

L. Sci. 190—Teaching Practicum, *or* L. Sci. 291—Advanced Study	3
L. Sci. 201—Reference and Bibliography	3
L. Sci. 203—Literature for Children	3
L. Sci. 205—Young Adult Literature	3
L. Sci. 222—Field Practice	3
L. Sci. 223—Cataloging and Classification	3
L. Sci. 250—Managing School Library Media Centers	3
An approved audiovisual materials course	3

SCIENCES

BIOLOGICAL SCIENCES—Grades 9-12 (To be combined with another teaching field) 30

(*NOTE: Due to general public school hiring practices and because of the interrelationships of concepts in science, it is strongly recommended that students who wish a specialization in biological sciences take their second specialization in mathematics, chemistry, physics, or general science.*)

Required Courses 24

Biol. 1 and 3—General Biology; Biol. 2 and 4—Gen. Biol. Lab	8
Biol. 101—Animals As Organisms	4
Biol. 102—Plants As Organisms	4
Biol. 103—Population Biology	4
Biol. 104—Cellular and Molecular Biology	4

Approved Electives 6

For. 140—West Virginia's Natural Resources	3
Bact. 141—General Bacteriology	4
Chem. 15—Fundamentals of Chemistry	4
Chem. 16—Fundamentals of Chemistry	4
Phys. 1—Introductory Physics	4
Phys. 2—Introductory Physics	4

	Required Sem. Hr.
Geol. 1—Physical Geology	3
Geol. 2—Physical Geology	1
Geol. 3—Historical Geology	3
Geol. 4—Historical Geology	1
Biology—Any 200-level course other than Biol. 209	4

CHEMISTRY—Grades 9-12 (To be combined with another teaching field) 30

(NOTE: Due to general public school hiring practices and because of the interrelationships of concepts of science, it is strongly recommended that students who wish a specialization in chemistry take their second specialization in mathematics, biology, physics, or general science.)

Required Courses 24

Chem. 15—Fundamentals of Chemistry	4
Chem. 16—Fundamentals of Chemistry	4
Chem. 115—Introductory Analytical Chemistry	4
Chem. 133-135—Organic Chemistry	4
Chem. 134-136—Organic Chemistry	4
Chem. 141-142—Physical Chemistry, *or* Chem. 246, 247—Introduction to Physical Chemistry	4

Approved Electives 6

Phys. 1—Introductory Physics	4
Phys. 2—Introductory Physics	4
Phys. 11—General Physics	4
Phys. 12—General Physics	4
Geol. 1—Physical Geology	3
Geol. 2—Physical Geology	1
Geol. 3—Historical Geology	3
Geol. 4—Historical Geology	1
Chem. 201—Chemistry Literature	2
Chem. 210—Instrumental Analysis	3
Chem. 235—Methods of Structure Determination	4

GENERAL SCIENCE—Grades 5-12 (To be combined with another teaching field) 35

Required Courses 35

Astro. 106—Descriptive Astronomy	3
Biol. 1—General Biology and Biol. 3—Gen. Biol. Lab	4
Biol. 2—General Biology and Biol. 4—Gen. Biol. Lab	4
Chem. 11 and 12—Survey of Chemistry, *or* Chem. 15 and 16—Fundamentals of Chemistry (If your second field is Chemistry)	8
Phys. 1 and 2—Introductory Physics, *or* Phys. 11 and 12—General Physics	8
Geol. 1—Physical Geology	3
Geol. 2—Physical Geology	1
Geol. 3—Historical Geology	3
Geol. 4—Historical Geology	1

PHYSICS—Grades 9-12 (To be combined with another teaching field) 28-30

(NOTE: Due to general public school hiring practices and because of the interrelationships of concepts in science, it is strongly recommended that students who wish a specialization in Physics take their second specialization in mathematics, chemistry, biology, or general science.)

Either of the two programs below will satisfy the requirements for the 9-12 specialization in Physics.

	Required Sem. Hr.
Program A	29
Required Courses	20
(No Calculus prerequisite)	
Phys. 1—Introductory Physics	4
Phys. 2—Introductory Physics	4
Phys. 7—Physics of Music	3
Phys. 8—Light, Vision, and Color	3
Phys. 117—Descriptive Meteorology	3
Phys. 354—Outline of Modern Physics	3
Approved Electives	9
Astro. 106—Descriptive Astronomy, *or* Astro. 216—Astronomy for Teachers	3
Phys. 116—Photography, *or* Phys. 357—Photography	3
Phys. 124—Introduction to Modern Physics	4
Phys. 263—Nuclear Physics	3
Phys. 313—Introductory Electronics	3
Phys. 355—Workshop for Physics Teachers	3
Chem. 15—Fundamentals of Chemistry	4
Chem. 16—Fundamentals of Chemistry	4
Math. 15—Calculus	4
Math. 16—Calculus	4
Geol. 1—Physical Geology	3
Geol. 2—Physical Geology Laboratory	1
Geol. 3—Historical Geology	3
Geol. 4—Historical Geology Laboratory	1
Program B	28-30
Required Courses	19
(Prerequisite: Math. 15 and 16)	
Phys. 11—General Physics	4
Phys. 12—General Physics	4
Phys. 124—Introductory Modern Physics	4
Phys. 231—Theoretical Mechanics	3
Phys. 233—Introductory Electricity and Magnetism	3
Phys. 241—Advanced Physics Laboratory	1
Approved Electives	9-11
Phys. 232—Theoretical Mechanics	3
Phys. 234—Introductory Electricity and Magnetism	3
Phys. 241—Advanced Physics Laboratory	2-4
Phys. 251—Introductory Quantum Mechanics	3
Phys. 263—Nuclear Physics	3
Phys. 271—Solid State Physics	3
Phys. 283—Thermodynamics	3
Chem. 15—Fundamentals of Chemistry	4
Chem. 16—Fundamentals of Chemistry	4
Geol. 1—Physical Geology	3
Geol. 2—Physical Geology Laboratory	1
Geol. 3—Historical Geology	3
Geol. 4—Historical Geology Laboratory	1
SOCIAL STUDIES—Grades 5-12 (Single Teaching Field)	54
Required Courses	
Hist. 1, 2—Western Civilization	6
Hist. 52, 53—Growth of American Nation	6

	Required Sem. Hr.
Hist. 153—West Virginia, *or* Hist. 261—Economic and Social Development of West Virginia	3
Geog. 7—Physical Geography	3
Geog. 8—Human Geography	3
Select one course from Geog. 109, 140, 141, 142, 143, 144, 145	3
Econ. 54—Principles of Economics	3
Econ. 55—Principles of Economics	3
Pol. S. 1, *or* 120, *or* 160, *or* 221	3
Pol. S. 2—American Federal System	3
Soc. & A. 1, *or* 5, *or* 102	3
Soc. & A. 140—Social Change in Appalachia	3
Soc. & A. 122, *or* 135, *or* 222	3
Electives in History, Geography, Sociology and Anthropology, Political Science, Economics, or Psychology 1	9

SOCIAL STUDIES—Grades 5-8 (Second Field required) 30

Required Courses

Econ. 54—Principles of Economics	3
Geog. 7—Physical Geography	3
Geog. 8—Human Geography	3
Hist. 1—Western Civilization: Antiquity to 1600	3
Hist. 2—Western Civilization: 1600 to Present	3
Hist. 52—Growth of the American Nation to 1865	3
Hist. 53—Making of Modern America, 1865 to the Present	3
Hist. 153—West Virginia, *or* Hist. 261—Economic and Social Development of West Virginia	3
Pol. S. 2—The American Federal System	3
Soc. & A. 1—Introduction to Sociology, *or* Soc. & A. 102—Social Problems	3

Courses of Instruction in Education

C&I 7 is a prerequisite to all other courses in Education.

Curriculum and Instruction (C&I)

7. *Introduction to Education.* I, II, S. 2 hr. Concepts underlying the educational system in the American society. Gives the student experience in identifying the student's values, attitude, and feelings with those of today's community and youth. Includes a required field experience. *(Speech and hearing screening required.)*

100. *Elementary-Early Childhood General Methods.* I, II. 3 hr. PR: C&I 7 and 120, Ed. P. 103, 105, Rdng. 221. Introduction to Education, including analysis of professional problems and procedures in school systems. Includes a required field experience. *(This course is a part of the pre-student teaching block which consists of C&I 130, 140, 150, and Rdng. 240.)*

104. *Principles of Teaching in Secondary Schools.* I, II, S. 4 hr. General professional education course emphasizing methods applicable to all academic areas. *(Not available to undergraduates during Summer.)*

120. *Elementary-Early Childhood Language Arts.* I, II, S. 3 hr. PR: C&I 7. Conc.: Rdng. 221. Instructional practice to develop communication skills of listening, speaking, and writing.

124. *Teaching Language Arts: Secondary School.* I, II. 3 hr. Includes an examination and application of relevant curricular materials and teaching techniques.

125. *The Teaching of Foreign Languages.* I, II, S. 3 hr. Methods and materials in the secondary school. *(Also listed as Lang. 221.)*

126. *Methods of Teaching Library Science.* I, II. 2 hr. Methods and materials of high school teaching.

130. *Elementary-Early Childhood Mathematics.* I, II. 3 hr. PR: Math. 33, 34, 131, C&I 120, Ed. P. 103, 105, Rdng. 221. Materials and methods for teaching mathematics emphasizing manipulative devices and activity learning for development of mathematical concepts. Field experience required. *(To be taken with C&I 100, 140, 150 and Rdng. 240.)*

134. *Teaching Mathematics: Secondary School.* I, II. 3 hr. Includes an examination and application of relevant curricular materials and teaching techniques.

140. *Elementary-Early Childhood Science.* I, II. 3 hr. PR: P. Sci. 1, 2, Biol. 1 or 2, C&I 120, Ed. P. 103 and 105, Rdng. 221. Modern methods and materials for teaching science with emphasis on investigative skills and attitudes. Includes a required field experience. *(To be taken concurrently with C&I 100, 130, 150 and Rdng. 240.)*

144. *Teaching Science: Secondary School.* I, II. 3 hr. Includes an examination and application of relevant curricular materials and teaching techniques.

150. *Elementary-Early Childhood Social Studies.* I, II. 3 hr. PR: 12 hr. Social Studies, C&I 120, Ed. P. 103 and 105, Rdng. 221. Study of materials and activity-oriented procedures for teaching of social studies. Includes a required field experience. *(To be taken with the pre-student block which consists of C&I 100, 130, 140 and Rdng. 240.)*

154. *Teaching Social Studies: Secondary School.* I, II. 3 hr. Includes an examination and application of relevant curricular materials and teaching techniques.

160. *Vocational Agriculture.* I, II. 3 hr. Methods and materials of high school teaching. *(Also listed as Ag. Ed. 160.)*

165. *Art Education in the Elementary School.* I. 3 hr. *(Also listed as Art 165.)*

166. *Art Education in the Secondary School.* II. 3 hr. *(Also listed as Art 166.)*

167. *Materials and Methods in Elementary School Music.* I, II. 3 hr. *(Also listed as Music 151.)*

168. *Methods of Teaching Music Education.* I, II, S. 3 hr. Methods and materials in secondary school music. *(Also listed as Music 152.)*

174. *Methods of Teaching Physical Education.* I, II. 3 hr. Methods of teaching physical education. *(Also listed as P.P.E. 133.)*

175. *Methods of Teaching Home Economics.* I, II. 3 hr. Methods and materials of high school teaching. *(Also listed as H.E.Ed. 175.)*

187. *Student Teaching: Elementary-Early Childhood.* I, II. 4-12 hr. PR: For elementary and early childhood undergraduates who meet eligibility requirements and other guidelines. (Applicable to preschool, nursery, day care, child care, kindergarten, primary grade, or elementary school.) Experiences with children 3-5 years of age are required of all students in Early Childhood.
    1. At the time of application for student teaching, have a minimum overall grade-point average of 2.25 and a 2.25 average in both specialization and education course work. The above requirements must also be met at the end of the semester prior to student teaching (not including summer sessions).
    2. Have completed all courses in education and three-fourths of course work required in area of specialization before the student teaching semester.
    3. Submit positive evidence that the applicant meets requirements of physical condition and emotional stability necessary for performance of duties as a teacher.

4. Exhibit reading, writing, speaking, and hearing proficiencies necessary for the teaching profession. Remediation will be required before student teaching for those who do not demonstrate acceptable competencies.
5. Admission is by application made before March 1 of the preceding year to the Director of Student Teaching.
6. Additional courses may not be taken with student teaching block.
7. Student teaching will be done in selected centers throughout the state. Students who wish to teach in an Indian Reservation school must make that decision in the Junior year. Therefore, students should be prepared to live off-campus if so assigned and to provide their own transportation.
   NOTE: Students must avoid employment, social commitments, or housing contracts which would interfere with an off-campus assignment.

188. *Student Teaching: Secondary Education.* I, II. 4-12 hr. PR: Students enrolled in Secondary Education undergraduate programs who meet eligibility requirements and other guidelines:
   1. At the time of application for student teaching have a minimum overall grade-point average of a 2.25, 2.25 average in course work in the teaching fields, and 2.25 average in education course work. The above requirements must also be met at the end of the semester prior to student teaching (not including summer sessions).
   2. Have completed all courses in education and three-fourths of course work required in each teaching field before the student teaching semester.
   3. Submit positive evidence that the applicant meets requirements of physical condition and emotional stability necessary for performance of duties of a teacher.
   4. Exhibit reading, writing, speaking, and hearing proficiencies necessary for the teaching profession. Remediation will be required before student teaching for those who do not demonstrate acceptable competencies.
   5. Admission is by application made before March 1 of the preceding year to the Director of Student Teaching.
   6. Additional courses may not be taken with student teaching block.
   7. Student teaching will be done in selected centers throughout the state. Students who wish to teach in an Indian Reservation school must make that decision in the Junior year. Therefore, students should be prepared to live off campus if so assigned and to provide their own transportation.
      NOTE: Students must avoid employment, social commitments, or housing contracts which would interfere with an off-campus assignment.

205. *The Junior High School.* I, II, S. 2 hr. PR: Consent. Developing philosophy, program, and practices of the junior high school.

210. *Early Childhood Education* 1. I, II, S. 3 hr. PR: CD&FS 216, Ed. P. 103 or 105. *(A field experience with children 3-5 years of age is required.)* Introduction to methods and materials in early childhood education curriculum instruction and program organization, development and evaluation. The content of this course is applicable to field placement in a preschool, nursery school, day care, and/or childhood care center.

211. *Early Childhood Education* 2. I, II, S. 3 hr. PR: CD&FS 216, Ed. P. 103 or 105. *(A field experience with children 3-5 years of age is required.)* This course is designed for individuals who will be working with early childhood programs for children under 8 years of age. The various aspects of early childhood education are studied in relationship to organizational and administrative structures. This includes planning, budgeting, staffing, supervising, and evaluating comprehensive learning facilities for young children.

212. *Methods in Preschool Education.* I. 3 hr. PR: Ed. F. 1 or C&I 7 or equiv. Development of an experiential model of teaching young children. Application of methods in basic needs areas of nursery-early childhood education consistent with an experiential model of teaching.

214. *Creative Experiences in Early Childhood.* II. 3 hr. PR: Ed. F. 1 or C&I 7 or equiv. Examination of creative experiences for young children and their relationship to child development. A special focus on play behavior as a learning medium with emphasis on program planning, curriculum development, and instructional strategies.

216. *Early Language and Communication Experiences.* I. 3 r. PR: Ed. F. 1 or C&I 7 or equiv. Presents activities for developing language and communication skills in children 2-5 years of age. Covers a broad range of temporary and enduring forms of communication in visible and audible media.

218. *Management of Preschool Education.* II. (Alternate Years.) 3 hr. PR: Ed. F. 1 or C&I 7 or equiv. *(A field experience with children 2-5 years of age is required.)* Planning, designing, and assessing programs for children ages 2-5 years with emphasis on management skills.

224. *Approaches to Teaching Language.* II. 2 hr. PR: Lingu. 1 and Engl. 2. Designed for prospective teachers of English and language arts. Focus is upon planning and implementing methods of teaching English as a language. Materials and resources appropriate for public school instruction are analyzed and utilized.

225. *Approaches to Teaching Literature.* II. 2 hr. PR: Junior standing. Designed for prospective teachers of English and language arts. Course focuses upon methodologies for teaching literature in public schools. Workshop format will provide opportunities for peer teaching activities as students apply methods of teaching literature.

267. *The Music Education Program.* S. 3 hr. PR: Consent. Organization and administration of the complete music education program for grades 1-12.

280. *Special Problems and Workshops.* I, II, S. 2-4 hr. *(Maximum of 8 semester hours may be applied toward the master's degree.)* PR: 14 hr. in education. Credits for special workshops and short intensive unit courses on methods, supervision, and other special topics.

287. *Advanced Clinical Experience.* I, II, S. 1-6 hr. PR: Consent. Clinical experience in teaching-learning situations at any level.

Health Education (Hl. Ed.)

The following service courses are offered. Teacher certification in health education is not available at the undergraduate level.

50. *History and Philosophy of Health Education.* 3 hr. Provides the student with an historical perspective of health education's development, its present status, and its current philosophical foundations.

70. *Health of the Individual.* 3 hr. Examines personal health-related problems in terms of information, services, and action, as they relate to attainment and maintenance of individual health. *(Course will not be offered Spring and Summer, 1986-87.)*

71. *Health in the Community.* 3 hr. Develops an understanding of the organization, structure, and function of official, voluntary, and professional community health components in terms of their protecting and maintaining the health of the individual and the community. *(Course will not be offered Fall and Summer, 1986-87.)*

101. *Elementary School Health Program.* 2 hr. PR: Ed. P. 103 or 105 and junior or senior standing. The organization, educational aspects, and personnel relationships involved in school health services, healthful school living, and health education. *(Course will not be offered Summer 1987.)*

102. *Secondary School Health Program.* 2 hr. PR: Ed. P. 103 or 105 and junior or senior standing. The organization, educational aspects, and personnel relationships involved in school health services, healthful school living, and health education. *(Course will not be offered Summer 1987.)*

104. *Organization and Administration of the School Health Program.* 3 hr. PR: Hl. Ed. 71. The underlying philosophy for the organization, structure, administrative policies and procedures, and legal aspects of the school health program.

220. *Drug and Alcohol Abuse Prevention.* 3 hr. Experiences designed to prevent the development of abusive drug-taking relationships by focusing on psychological variables such as self-esteem, coping skills, and development of support networks.

290. *Women and Health.* 3 hr. Examination of theories, myths, and practices surrounding women's physical and mental health from both historical and present-day perspectives. Exploration of specific health issues and controversies and the rise of the women's health movement. *(Course will not be offered Fall 1986-87.)*

Reading (Rdng.)

(Reading is primarily a service area to students in early childhood education, elementary education, secondary education, and special education. There are no specializations which an undergraduate can pursue.)

221. *Developmental Reading.* I, II, S. 3 hr. PR: Consent. Fundamentals of reading instruction. Emphasizes classroom organization and teaching techniques.

222. *Reading in the Content Areas.* I, II. 2 hr. Skills and strategies needed by content area teachers to reinforce the reading skills necessary for the effective learning of secondary students in the content areas.

240. *Corrective Language Arts Techniques.* I, II. 3 hr. PR: Rdng. 221, consent. Fundamentals of informal language arts diagnosis and corrective classroom language arts instruction. A practicum for the utilization of informal diagnosis and corrective techniques.

283. *Special Workshop in Reading.* I, II, S. 1-6 hr. For elementary and secondary students in preservice education programs, as well as elementary and secondary teachers in inservice education.

Family Resources (Home Economics)

The Family Resources program is a group of interrelated areas of study having a common core which is concerned with preparing professionals for careers that promote optimal individual and family development.

The mission of this program is to seek, focus, and apply relevant concepts and principles from the sciences and arts into a program that enhances the physical, biological, psychological, economic, social, and aesthetic needs of family members. This program prepares the student with education that:

—Provides information on the necessities of life such as food, clothing, shelter, and human relations.

—Assists in meeting established goals by using all available resources.

—Aids in assessing alternatives for achieving basic needs.

—Develops the ability to make informed decisions which enhance the quality of life for individuals and families.

—Improves conditions of living in the home, institutions, and community.

—Improves goods and services used by families.

A variety of laboratory experiences, selected field experiences, and internships help students accomplish the goals of their professional develop-

ment. Students pursue careers as advocates for consumers and as professionals in home economics-related businesses and service industries.

Preparation for the following career opportunities are possible by enrollment in the Family Resources program:

a. *Child Development and Family Studies*—Child development specialist, nursery education, family life education, child welfare, family service occupations, and other community service fields.

b. *Foods and Nutrition*—Dietetics, food service management, human nutrition, nutrition education, and the food industry.

c. *Home Economics Education*—Teaching vocational home economics in grades 5-8 and 9-12; community involvement in extension, social agencies, business, journalism, family finance, and general home economics.

d. *Interior Design*—Residential and contract interior design.

e. *Textiles, Clothing, and Fashion Merchandising*—Fashion merchandising, and the textile and apparel industries.

The degree of Bachelor of Science in Family Resources is granted following completion of a minimum total of 129 hours, including a minimum of 58 upper-division hours.

The 129 hours include Fam. R. 1—Introduction to Family Resources—which is required of all freshman students in the first semester.

All students who entered the program after December, 1983, must have a 2.25 grade-point average in courses required for their emphasis in order to graduate.

Required Courses *Hr.*

I. University Core Curriculum
English Composition 6
University Core Groups A, B, and C 36
Total 42
II. Family Resources Professional Core 12-13
III. Programs
a. Child Development and Family Studies
1. Required courses in Child Development and Family Studies 35
2. General electives 36
Total 71
b. Interior Design
1. Required courses in Interior Design 33
2. Additional courses in art, journalism, marketing, textiles, and speech pathology and audiology 21
3. General electives 17
Total 71
c. Textiles, Clothing, and Fashion Merchandising
1. Required courses in Family Resources 36
2. Required general courses 18
3. Electives (restricted choice) 12
4. General electives 8
Total 74
d. Home Economics Education
(Teacher Certification) (Grades 5-8, 9-12)

Students wishing a vocational teaching certificate and degree must take specified courses in the University Core Curriculum and at least 9 hours in each of the five subject-matter areas in Family Resources. *(See Programs for Secondary School Teachers under Education.)*

It is possible to follow a non-teacher certification program.

e. Dietetics, Nutrition, and Foods and Institutional Administration

Two options in dietetics fulfill the academic requirements of the American Dietetic Association. After obtaining the B.S. degree with a dietetics option, students must enroll in a dietetic internship or gain other experience approved by the American Dietetic Association in order to be eligible for the Registration Examination.

In the University Core Curriculum, some courses are specified by the programs. In addition, students must take:

(General Dietetics)

1. Family Resources Core (Three of these courses are required.)	12-13
2. Additional requirements in sciences, management, math, learning theory, nutrition, and foods and institutional administration	63
3. General Electives	12
Total	87-88

(Management)

1. Family Resources Core (Four of these courses are required.)	12-13
2. Additional required courses in business, management, accounting, biological sciences, and foods and institutional administration	61
3. Electives	14
Total	87-88

Students can emphasize areas in food service management, foods, or nutrition. These areas have fewer specific requirements but do not meet all academic requirements for entrance into an approved dietetic internship.

Courses of Instruction in Family Resources

Due to curricular review, course offerings and sequence may vary from semester listed.

(Where a permit is required to register for a course offered by Family Resources, it may be given only by the instructor or the program coordinator.)

Child Development and Family Studies (CD&FS)

10. *Introduction to Child Development.* I, II. 3 hr. Introduction of the major explanations (i.e., theories) and concepts in the study of child development which will be integrated in an analysis of children's physical, cognitive, and social development.

12. *Introduction to Marriage and the Family.* I, II. 3 hr. Study of dating patterns, mate selection, premarital relationships, and early marital adjustment. Focus on problem solving and communication between partners.

110. *Introduction to Parenting.* I. 3 hr. Introduction of terminology, descriptions, and explanations of the parental role and parent-child interactions. Emphasis on social and personal definitions of the parental role and on the problems and changes in parent-child relationships.

111. *Infant Development.* II. 3 hr. PR: CD&FS 10. Developmental characteristics and environmental effects on the child during the prenatal period and the first two years with implications for guidance and care.

112. *Toddler and Preschool Development.* I. 3 hr. PR: CD&FS 10 or consent. Physical, social, emotional, and cognitive development of children ranging from 18 months to 6 years with implications for guidance and care.

211. *Middle Childhood-Early Adolescent Development.* I. 3 hr. PR: CD&FS 10. Analysis and investigation of developmental factors in middle childhood-early adolescence. Consideration and diagnosis of physical, emotional, social, familial, moral, and intellectual interactions affecting the child 6-14. *(Offered in Fall of odd years.)*

212. *Adolescent Development.* II. 3 hr. PR: CD&FS 10. Adolescent in contemporary American culture, including normative physical, social, and personality development; relationships within various typical social settings. (e.g., family, school, community, peer group). *(Offered in Spring of even years.)*

213. *Contemporary Issues in Family Relations.* II. 3 hr. Study of recent research findings in the major areas of family relationships. Topics include effects of divorce upon children, impact of employment upon the marital relationship, and spousal violence.

214. *Family Development.* I. 3 hr. The contemporary family from formation of material unit to death of both spouses. Special attention to the use of the family life cycle and developmental tasks.

215. *Parenting Strategies.* II. 3 hr. PR: Senior or graduate standing or consent. Focus on the interactions between parent and child. Analysis of typical problems which occur in parenting. Deals solely with normal daily situations which often occur in the home.

216. *Child Development Practicum.* I, II. 3-4 hr. PR: CD&FS 112 or consent. Application of child development principles. Involves planning developmentally appropriate activities for 3- and 4-year-old children at the University Child Development Laboratory.

219. *The Growing Years.* II. 3 hr. A televised course offered primarily for off-campus students to become familiar with development of children during their growing years. How to recognize the diversity of approaches in child development research and theory.

Family Resources (Fam. R.)

1. *Introduction to Family Resources.* I, II. 1 hr. Exploration of career possibilities in the six major professional emphasis areas of family resources to enable students to make best possible class selections.

191. *Undergraduate Special Topics.* I, II, S. 1-4 hr. per sem.; max. 9 hr. PR: Consent.

194. *Undergraduate Community Internship/Practicum.* I, II, S. 1-12 hr. PR: H.E.Ed. 281 or consent. Supervised participation in the family resources field in settings such as: business and industry; government bureaus; communication and media; social service and health agencies.

195. *Undergraduate Seminar.* I, II, S. 1-4 hr. per sem.; max. 9 hr. PR: Written consent.

Foods and Institutional Administration (FIA)

55. *Food Principles and Practices.* I. 4 hr. Basic principles of the science of food preparation. Emphasis on understanding the reasons for basic practices and procedures essential for obtaining a standard product and on function of ingredients.

151. *Meal Management.* II. 4 hr. PR: FIA 55, Nutrn. 71. Management of time, energy, money, and other human resources in planning and preparing nutritionally adequate meals within the family setting.

153. *Quantity Food Production Systems 1.* I. 4 hr. PR: FIA 55, 151. Study of basic concepts and application of basic principles in quantity food procurement, processing, and service; standardized procedures, specifications, and bid buying for supplies and equipment.

154. *Food Systems Equipment; Layout, Design.* II. 3 hr. PR: FIA 153 and consent. Basic principles in the design and layout of various food service operations; principles governing the purchase, use, and operation of equipment. Field trips and clinical experience. *(Offered in odd years.)*

158. *Personnel Functions in Food Service.* II. 3 hr. PR: FIA 153; Manag. 105. Personnel functions in large-scale food service systems.

254. *Experimental Foods.* II. 4 hr. PR: FIA 55, organic chemistry or consent. Study of basic chemical processes that occur within food systems including the effects of storage, processing, and alterations in formulation on qualities of food products; introduction to laboratory methodology in foods research.

257. *Food, Labor, and Cost Control.* II. 3 hr. PR: FIA 153, Acctg. 51. Food systems accounting and cost control. Techniques for analyzing, managing, and controlling food and labor costs. *(Offered in even years.)*

258. *Food Systems Management Practicum.* II. 4 hr. PR: FIA 153 and consent. Ten weeks or 400 hours of practical experience in operations of the type in which the student is majoring.

Home Economics Education (H.E.Ed.)

175. *Methods of Teaching Home Economics.* I. 3 hr. To be taken the semester or year before student teaching. Planning, implementing, and evaluating teaching-learning experiences in a supportive learning environment. *(Also listed as C&I 175.)*

219. *Occupational Home Economics.* II. 3 hr. Prepares teachers to implement occupational home economics programs. Emphasis on organizing and administering programs, developing laboratory and work experiences, recruiting students, and evaluating progress.

278. *Vocational Home Economics.* II. 3 hr. PR: Senior standing or consent. Develops an understanding of federal vocational legislation to enable an individual to develop and implement programs in vocational education. *(Offered in Spring of even years.)*

281. *Contemporary Problems in Home Economics.* I. 3 hr. Applies the broad-based philosophy of home economics to current individual family and community problems, e.g., societal impact on families, changing consumer market, changing roles, day care, diminishing energy resources, career education, etc.

Home Management and Family Economics (HM&FE)

160. *Communication of Consumer Information.* II. 3 hr. *(Open to all students.)* Introductory experiences to develop public communication skills through live and mediated presentations that meet the informational needs of consumers.

161. *Family Economics.* I, II. 3 hr. Management of the family's money resources. Consideration of economic problems, planned spending and saving, and the consumer's role.

165. *Home Management: Principles and Applications.* I. 3 hr. *(Open to all students.)* Personally meaningful examination of the management process as it contributes to the development and effective use of human and non-human resources in the achievement of personal satisfaction in a changing world.

167. *Household Equipment.* I. 3 hr. *(Open to all students.)* A consumer approach to evaluating portable and major household equipment with a focus on concern for: energy efficiency, safety, task performance, ecological impact, and use and care. *(Offered in Fall of even years.)*

261. *Consumer Economics.* II. 3 hr. Understanding the consumer's role in our economy. Study of research methods and techniques used to identify, understand, and solve consumer problems.

262. *Introduction to Homemaker Rehabilitation.* II. 3 hr. PR: Consent. A comprehensive coverage of the historical development, philosophy, legislation, community resources, research and professional literature provides a base of knowledge needed by the student to enter the field of homemaker rehabilitation.

Interior Design and Housing (ID&H)

31. *Introduction to Design.* I, II. 3 hr. Survey of the varied areas of design with an emphasis on analyzing and evaluating the aesthetic and functional qualities of each.

32. *Interior Design Graphics 1.* II. 3 hr. Various presentation media and techniques used to provide communication skills such as drafting, rendering, perspective drawing, and layout organization for professional graphic presentation.

33. *Housing Design.* I, II. 3 hr. PR: ID&H 31 or consent. Housing and home planning. Selection, arrangement, and use of interior and exterior space for activities carried on, in, and around the home.

34. *Interior Design Graphics 2.* I. 3 hr. PR: ID&H 32. Study and application of color theory and techniques for use in graphic presentations. Special emphasis on the aesthetic and practical aspects of interior design.

35. *Interior Design and Housing.* II, S. 3 hr. PR: ID&H 31 or consent. A practical course in which the student becomes familiar with the fundamentals of interior design through work with floor plans, furniture selection and arrangements.

133. *Interior Design.* I, II. 3 hr. PR: ID&H 34. Study and application of the functional aspects of interior design through problem solving situations and extensive presentation work.

136. *Contract Design.* I. 3 hr. PR: ID&H 133. A studio course which will emphasize the contract aspects of the interior design field. The design of public spaces with particular emphasis on office planning and design as a work environment.

137. *Professional Practices for Interior Designers.* II. 3 hr. PR: ID&H 133. The relationships between the management/marketing functions and the design process. A problem solving approach to all the activities which contribute to the completion of an interior design installation.

233. *Decorative Arts 1.* I. 3 hr. PR: 9 hr. ID&H. The decorative arts—antiquity to American periods.

234. *Decorative Arts 2.* II. 3 hr. PR: ID&H 233. The decorative arts—American periods to present.

235. *Contemporary Interior Design.* I. 3 hr. PR: ID&H 234. Study of the history of interiors, 1900-present.

238. *Portfolio Design.* II. 3 hr. PR: Senior standing. Development and preparation of a portfolio for interior design and National Council for Interior Design Qualification examination.

239. *Interior Design Field Experience.* II. 3-9 hr. (May be repeated to 9 hr.) PR: Written consent, senior standing. Opportunity to learn and work within a professional environment with practicing designers.

Nutrition (Nutrn.)

71. *Introduction to Human Nutrition.* I, II. 3 hr. Nutrient structure, metabolism, integrated function and their importance to human well-being during all stages of the life cycle. Current concerns and those of special interest to college students in meeting nutrient needs.

172. *Contemporary Issues in Nutrition.* I. 3 hr. PR: Nutrn. 71. Contemporary issues in nutrition including a critical review of food practices and recent trends in nutrition. *(Offered in Fall of odd years.)*

179. *Introduction to Dietetics.* I. 1 hr. Coreq: Nutrn. 71. This is an introductory level course designed to acquaint prospective dietetic practitioners with the profession of dietetics.

260. *Advanced Nutrition.* I. 3 hr. PR: Nutrn. 71, physiology. Coreq.: Biochemistry. Role of food nutrients in physiological and biochemical processes of the body; nutritional needs of healthy individuals under ordinary conditions.

261. *Nutrition Laboratory Experimentation.* I. 1 hr. Coreq.: Nutrn. 260 or consent. Nutrient analysis and introduction to nutrition experimentation.

272. *Community Nutrition* 1. II. 2-3 hr. PR: Nutrn. 71. Beginning planning for community nutrition for individuals and families at various stages of the life cycle. Roles of concerned agencies and professional groups. Clinical experience in community facilities for the third credit-hour is optional.

274. *Nutrition in Disease.* II. 4 hr. PR: Nutrn. 71; physiology or consent; biochemistry required for dietetics majors. Nutritional care aspects of patients. Modification of diet to meet human nutrition needs in various clinical conditions.

279. *Dietetics As a Profession.* I. 1 hr. PR: Senior standing. Discussion of the profession of dietetics and the professional organization, American Dietetic Association (ADA). Completion of materials to meet ADA membership requirements.

Textiles and Clothing (Tx.&Cl.)

27. *Introductory Textiles.* I, II. 3 hr. Traditional background information and new developments in textiles. Special emphasis on development of raw materials into finished consumer goods.

121. *Clothing in Contemporary Society.* I. 3 hr. Clothing in relation to social, psychological, and economic factors, including a study of the clothing industry, trends, and cultural significance.

124. *Apparel Construction and Fitting.* II. 3 hr. PR: Tx.&Cl. 27 and sophomore standing. *(Textiles, Clothing and Home Economics Education majors only.)* Basic principles of apparel construction, pattern alteration, and fitting. Discussion of the differences in the quality of construction of ready-to-wear and couture apparel.

126. *History of Costume/Apparel Design.* I. 3 hr. PR: Tx.&Cl. 27, 124. A study of history of costume from the Egyptians to the present day. Beginning figure and fashion designing included, using historical garments as a basis for contemporary design.

127. *Textiles for Interiors.* II. 3 hr. PR: Tx.&Cl. 27. Examination of textile products for commercial and residential interiors. Production techniques, construction variables, and quality factors affecting serviceability are emphasized. Federal legislation governing labeling, mandates concerning safety, and marketing strategies influencing selection are presented.

194. *Fashion Merchandising Internship.* I. 3 hr. PR: Senior standing in Textiles and Clothing, and consent. An examination of fashion merchandizing practices is explored through an on-site supervised work experience. Students complete an activity log and check list; conferences are held with the internship coordinator.

221. *Socio/Psychological, Cultural Aspects of Dress.* II. 3 hr. PR: Tx.&Cl. 121 and senior standing or consent. A study of writings and research in the social, psychological, and cultural factors affecting clothing choices historically and contemporarily. Original research will be conducted by each student.

222. *Fashion Merchandising.* I. 3 hr. PR: Tx.&Cl. 121 and senior standing. Emphasis is placed on merchandising activities performed on the retail level, including planning sales and assortments, selecting merchandise for resale, controlling inventories, and determining profit. Basic mathematical formulas involved in merchandising are practiced.

224. *Flat Pattern Design.* I, II. 3 hr. PR: Tx.&Cl. 27, 124, 126 or consent. Opportunity for creative expression and for understanding of pattern design through flat pattern. Costumes designed and constructed by the student.

225. *Tailoring.* I, II. 3 hr. PR: Tx.&Cl. 27, 124, 224. Tailoring suits and coats. Emphasis on professional techniques, advanced fitting, and construction of garments.

226. *Apparel Design and Illustration.* II. 3 hr. PR: Tx.&Cl. 224 or consent. Art principles and fashion terminology explored to increase the ability to analyze apparel designs. Examination of different sources of design inspiration. Techniques of drawing from a live fashion model and various media for apparel design presentation.

227. *Advanced Textiles.* I, II. 3 hr. PR: Tx.&Cl. 27, 127. Comparative characteristics of all textile fibers are presented. Physical and chemical properties are explained with reference to fiber morphology and/or manufacturing processes.

228. *Clothing for Special Needs.* I. 3 hr. PR: Tx.&Cl. 224 or consent. Examines physical, psychological, and sociological clothing needs of handicapped and/or aged individuals. Historical developments, current research, and research needs are explored. Students conduct a pertinent individual research project.

229. *Fashion Merchandising Study Tour.* I or II. 1 hr. PR: Senior standing in textiles and clothing. An examination of the textiles and clothing industry is made through on-site visits to: historic costume and textile collections, apparel manufacturing plants, design showrooms, buying offices, pattern companies, and retail establishments. Readings included.

Special Education

The undergraduate Special Education program in the area of the mentally impaired (mild and moderate) is a teacher preparation program. Its major goals are to train students to become highly competent teachers of the mentally impaired and to provide multiple opportunities for the understanding of new and innovative methodological techniques. The program is offered as a subject specialization Grades K-12 in combination with the programs for Early and Middle School Teachers, Grades K-8.

West Virginia urgently needs trained personnel in all phases of education of handicapped children and youth. State legislation mandates the counties to provide services for the handicapped school-aged population.

The College of Human Resources and Education and the West Virginia Department of Education are in the process of reviewing and revising all certification programs. Students are warned that programs printed in the Catalog *may not be in effect at the time of their registration and are advised to see their adviser upon arrival on campus.*

PROGRAM FOR TEACHING THE MENTALLY IMPAIRED

(Early and Middle Childhood—Grades K-8)
(Mentally Impaired, Grades K-12)

(128 Semester Hours Required)

	Required Sem. Hr.
General Studies Requirements (K–4 and 5–8)	70
General	19
Engl. 1, 2—Composition and Rehetoric	6
L. Sci. 203—Literature for Children	3
Music 41—Fundamental Music Skills	2
Music 42—Teaching Elementary School Music	2
Hl. Ed. 101—Elementary School Health Program	2
G.P.E. 41—Movement Education and Rhythms	1
G.P.E. 42—Elementary Sports Skills	1
P.P.E. 43—Physical Education for Elementary Teachers	2
Core A	12
Art 3—Materials and Procedures	3
Engl. 35—Poetry and Drama, *or* Engl. 36—Short Story and Novel	3
Art 30—Appreciation of Visual Arts, *or* Music 30—Introduction to Music, *or* Theatre 30—Appreciation of Theatre	3
Core A elective	3
Core B	18
Soc. & A. 5—Introduction to Anthropology, *or* Soc. & A. 51—World Cultures	3
Hist. 1—Western Civilization: Antiquity to 1600	3
Hist. 52—Growth of the American Nation to 1865	3
Hist. 53—Making of Modern America, 1865 to Present	3
Hist. 153—West Virginia, *or* Hist. 261—Economic and Social Development of West Virginia	3
Geog. 7—Physical Geography	3
Core C	21
P. Sci. 1, 2—Introductory General Course	8
Biol. 1—General Biology, and Biol. 3, General Biology Lab, *or* Biol. 2—General Biology, and Biol. 4, General Biology Lab	4
Math. 33, 34—Introductory Mathematics for Elementary Teachers	6
Math. 131—Algebra and Geometry for Elementary Teachers	3
Teaching Specialization—Mentally Impaired	15
Sp. Ed. 250—Survey of Exceptional Children and Adults	3
Sp. Ed. 255—Introduction to Mental Retardation	3
Sp. Ed. 260—Curriculum and Methods in Special Education	3
Sp. Ed. 281—Developmental Language for Mentally Impaired	3
SPA 250—Survey of Oral Communication Disorders	3
Professional Education	50
General	20
C&I 7—Introduction to Education	2
Ed.P. 103—Human Development and Learning	3
Ed.P. 105—Human Growth and Development	3
C&I 120—Elementary Early/Middle Childhood Language Arts	3
Rdng. 221—Developmental Reading	3
C&I 210—Early Childhood Education 1	3
C&I 211—Early Childhood Education 2	3

	Required Sem. Hr.
Pre-Student Teaching Block	15
C&I 100—Elementary Early/Middle Childhood General Methods	3
C&I 130—Elementary Early/Middle Childhood Mathematics	3
C&I 140—Elementary Early/Middle Childhood Science	3
C&I 150—Elementary Early/Middle Childhood Social Studies	3
Rdng. 240—Corrective Language Arts Techniques	3
Student Teaching Semester	15
C&I 187—Student Teaching Elementary Early Childhood	6
Sp. Ed. 280—Student Teaching Clinical Experience: Special Education	6
C&I 280—Special Problems: Student Teaching Seminar	3

Special Education (Sp. Ed.)

250. *Survey of Exceptional Children and Adults.* 3 hr. PR: Consent. Introduction to all areas of exceptionality. Definition, psychological and educational characteristics, and social and vocational adjustment.

255. *Introduction to Mental Retardation.* 3 hr. PR: Consent. Historical, etiological, social, educational, and vocational aspects of mental retardation.

260. *Curriculum and Methods for Special Education.* 3 hr. PR: Sp. Ed. 250, 255 and/or consent. Organization of instruction, adaptation of teaching methods in several curricula areas and construction of materials.

262. *Curriculum and Methods for the Trainable Mentally Retarded.* 3 hr. PR: Sp. Ed. 250, 255 and/or consent. Special problems of curriculum development for the trainable child and adult and development of original construction of curricula materials. *(Course will not be offered in 1986-87.)*

265. *Industrial Arts in Special Education.* 3 hr. Experimentation with industrial arts and crafts suitable for instruction in special education classes. Discussion of factors involved in selection and manipulation of such media as leather, plastics, ceramics, wood, and metal. *(Course will not be offered in 1986-87.)*

280. *Student Teaching Clinical Experience in Special Education.* 1-6 hr. PR: Consent. Student teaching with the mentally impaired.

281. *Special Problems and Workshop in Special Education.* 2-4 hr. PR: Consent. To take care of credits for special workshops and short intensive unit course on methods, supervision, and other special topics.

Speech Pathology and Audiology

Speech Pathology and Audiology (SPA) is committed to the basic preparation of students interested in graduate work leading to a career in Speech Pathology and/or Audiology.

The emphasis of pre-professional undergraduate training in speech pathology and audiology is placed on broad education in basic speech and hearing sciences, anatomy and physiology of the speech and hearing mechanisms, normal development and behavior in the areas of speech, hearing, and language.

Graduates may prepare for careers by entering a graduate program at WVU or in other comparable programs for specialization in either speech pathology or audiology.

Upon completion of the master's degree the graduate will qualify for certification by the American Speech-Language-Hearing Association and by the West Virginia Board of Education.

General Requirements

Admissions

1. *Freshmen.* After completing one semester of course work at WVU, a freshman must obtain at least a 2.5 overall grade-point average as well as a 2.5 Speech Pathology and Audiology grade-point average. These averages must be maintained during the remainder of the undergraduate studies.

2. *Transfer Students.* When a student transfers into the unit of Speech Pathology and Audiology, whether it be from another major at WVU or from another university, that student must enter Speech Pathology and Audiology with an overall grade-point average of at least 2.5 and maintain a 2.5 for the duration of the undergraduate program in Speech Pathology and Audiology. Furthermore, the student must have and/or maintain at least a 2.5 grade-point average in Speech Pathology and Audiology course work for the remainder of the undergraduate program.

Bachelor of Science in Speech Pathology and Audiology (B.S.)

1. Fulfill the University Core Curriculum requirements.
2. Present a total of 128 hours, including 58 upper-division hours, and 15 hours in related areas.
3. Complete a minimum of 62 hours of Speech Pathology and Audiology academic courses.
4. For admission to the undergraduate program, as well as for continuation toward a degree, the student must maintain an overall grade-point average of 2.5, and an average in the major area of 2.5 or better, as well as exhibit the personal and professional qualities predictive of success in the profession.
5. Successfully complete minimum requirements in clinical practicum.
6. In order to graduate, the student must meet the minimum GPA of 2.5 in Speech Pathology and Audiology courses and 2.5 GPA cumulative and must successfully complete the clinical requirements.

SUGGESTED DISTRIBUTION OF COURSES
FOR BACHELOR OF SCIENCE DEGREE IN SPEECH PATHOLOGY AND AUDIOLOGY

First Year	Second Year
Courses to satisfy Core Curriculum	Continuation of Core Courses
Engl. 1	Engl. 2
Ling. 1	SPA 50, 152, 153, 154
Psych.1	Stat. 101
SPA 80	Courses to satisfy related area.
Third Year	**Fourth Year**
SPA 156, 254, 257 and 13 semester hours of required SPA 281: Special Topics.	SPA 220, 223, 251, 252, 253, 260, 282 or 283
Courses to satisfy related areas and/or complete Core Curriculum	Electives/courses to complete 128 semester hours.

Speech Pathology and Audiology (SPA)

(Due to College curriculum review, actual course sequence and offering may differ from Catalog listings. Please see program adviser.)

50. *Introduction to Speech and Hearing.* I. 3 hr. Introduction to the profession of speech pathology and audiology, with emphasis on the role identification of health professionals. Normal speech production and language development.

80. *Speech Improvement: Theory and Performance.* I, II. 3 hr. Designed for improvement of the student's speech based upon theory and demonstrated performance of voice and diction skills and public-speaking skills for effective communication in a variety of speaking situations.

152. *Basic Speech and Hearing Science.* I. 3 hr. Application of the physical and social sciences to an understanding of the role of speech production and the acoustics of sound in human communication.

153. *Phonetics.* II. 3 hr. PR: SPA 50 or consent. Standard speech sounds of the English language. Use of phonetic symbols for recording speech sounds. Classification systems presented, with emphasis on distinctive feature analysis.

154. *Anatomy of the Speech and Hearing Mechanism.* II. 3 hr. Anatomical and physiological study of the vocal mechanisms and the ear.

156. *Articulation.* II. 3 hr. PR: SPA 50. Characteristics of normal articulation development and production. Nature and etiology of articulation disorders presented. Diagnostic procedures and general goals of therapy.

182. *Introductory Clinical Practice in Speech.* I, II, S. 1-3 hr. PR: Consent. Supervised assisting of speech diagnosis and therapy, including data keeping, preparation of clinical materials employed in therapy, observation of direct therapy, and written evaluations of observed sessions. *(Graded Pass-Fail only.) (Course will not be offered in 1986-87.)*

183. *Introductory Clinical Practice in Audiology.* I, II, S. 1-3 hr. PR: Consent. Supervised assisting of hearing diagnosis and therapy, including data keeping, preparation of clinical materials employed in diagnosis and therapy, observation of direct testing and therapy, and written evaluations of observed sessions. *(Graded Pass-Fail only.) (Course will not be offered in 1986-87.)*

210. *Manual Communication.* I, II. 3 hr. PR: Consent. Development of skills needed to communicate in sign language. The manual alphabet, basic number concepts, and the basic vocabulary of traditional American signs.

212. *Intermediate Manual Communication.* II. 3 hr. PR: SPA 210 or consent. Improve skills needed to communicate in sign language. Includes increasing sign language vocabulary, practicing fingerspelling, and communicating with signs. *(Course will not be offered in 1986-87.)*

220. *Audiological Assessment.* I. 4 hr. PR: Consent. Physics of acoustic signal production; introduction to basic audiometric techniques and interpretation.

222. *Hearing Conservation.* II. 2 hr. PR: SPA 220 or consent. Identification audiometry for infants and pre-school and school-age children; hearing conservation in industry. *(Course will not be offered in 1986-87.)*

223. *Aural Rehabilitation.* II. 3 hr. PR: SPA 220 or consent. Rehabilitative approaches to management in the auditorially handicapped individual. Medical, audiological, and social aspects of rehabilitation. Procedures of speech reading and auditory training will be examined and evaluated.

241. *Introduction: Speech Practicum.* I. 2 hr. PR: Consent. Routine clinical and administrative procedures in speech pathology, emphasizing observation, report writing, test administration and interpretation, equipment demonstration, clinical procedures, and language sampling. *(Course will not be offered in 1986-87.)*

242. *Introduction: Hearing Practicum.* I. 2 hr. PR: Consent. Routine clinical procedures in audiology are presented emphasizing observation, report writing, record keeping, equipment, and hearing testing. *(Course will not be offered in 1986-87.)*

250. *Speech-Language-Hearing: Development-Disorders.* I, II, S. 3 hr. *(Non-majors.)* PR: Consent. Discussion of normal processes and disorders of speech, language, and hearing in children and adults. Orientation course for students and teachers in early childhood, elementary, and secondary education, language arts specialists, psychologists, and rehabilitation specialists.

251. *Cleft Palate and Voice Disorders.* II. 3 hr. PR: SPA 50 or consent. Normal vocal production and embryological development of the face and palate. Nature and etiology of disorders of cleft palate and voice, diagnosis, and general goals of therapy.

252. *Stuttering.* I. 3 hr. PR: SPA 50. Development of normal fluency versus nonfluency examined in addition to the nature, etiology, theories, classification,and prognostic indicators of stuttering. General formal and informal assessment, treatment, and counseling procedures.

253. *Cerebral Palsy and Aphasia.* I. 3 hr. PR: SPA 50 or consent. Speech and language disorders related to cerebral injury, with emphasis on nature and etiology of cerebral palsy and aphasia. Diagnosis and general goals of therapy.

254. *Language Acquisition and Behavior.* I. 3 hr. Normal processes involved in the acquisition of language, including the development of phonological, semantic, and syntactical systems. Application of these processes to the diagnosis and treatment of language disorders.

257. *Public School Clinical Programs.* I. 3 hr. PR: SPA 50 or consent. Organization and structure of clinical programs in public school setting. Discussion of state and federal regulations, case selection, scheduling, program planning, and other administrative matters.

260. *Language Disorders in Children.* II. 3 hr. PR: SPA 254 or consent. Assessment and remediation procedures are examined. The utilization of current tests and analysis procedures in diagnosis are presented. Treatment approaches include commercially available programs and student-developed treatment strategies.

263. *Preschool Deaf Child.* I. 3 hr. PR: Consent. Importance of early detection and education, language development of congenitally deaf child, and parents' role in early childhood education. *(Course will not be offered in 1986-87.)*

265. *Parent Programs: Communicatively Disordered Children.* II. 2 hr. Students will learn to organize and implement parent involvement programs in a variety of settings, interview parents, conduct conferences, utilize appropriate materials, and interact effectively with parents of communicatively handicapped children through lectures and practica.

281. *Special Topics.* I, II, S. 1-6 hr. per sem.; (max. 6 hr.). PR: Consent. Independent study in speech pathology, audiology, and speech and hearing sciences.

282. *Clinical Practice in Speech.* I, II, S. 1-6 hr. PR: Consent. Supervised diagnosis and therapy of speech disorders.

283. *Clinical Practice in Audiology.* I, II, S. 1-6 hr. PR: Consent. Supervised diagnosis and therapy of hearing disorders.

Technology Education

The technology education program is a graduate program only. However, certain courses offered by the program faculty at the 200 and 300 levels are available as electives for qualified junior and senior students. (T.E. 280, Women in International Development, and T.E. 281, Introduction to Technology, qualify as Core B courses. See the *Graduate Catalog.*)

The primary focus of the program is the study of technology, the relationship of technical systems to the civilization process, and the implications of changes in these systems on the quality of life and the education of citizens. Faculty and students in the program are commited to a continuing investigation of the impact of communication systems, transportation systems, and production systems on people, society and the environment. The goal of the program is an increased level of understanding about technical means so as to provide the basis for developing, controlling, directing and redirecting technical systems.

Perley Isaac Reed School of Journalism

The Perley Isaac Reed School of Journalism, one of the oldest in the United States (established in 1939), offers appropriate education to students who work in the broad area of communications in our complex society.

Many of the more than 2,000 graduates of the School of Journalism are using their broad education and training by covering news events throughout the world for Associated Press, United Press International, and other news media; by managing major accounts in such advertising agencies as J. Walter Thompson and Carl Byoir and Associates in New York City; and by serving in public relations positions with corporations and other institutions. They are newspaper reporters, broadcasters, university professors, business men and women, army officers, school principals, and homemakers.

The study of journalism—once limited to vocational training of newspaper reporters—now includes the many ways in which a person uses communication, with emphasis on ethics and responsibility in the broad study of mass communication and society. Such an education must be interdisciplinary, based upon the liberal arts and social sciences.

A journalism education involves more than learning how to write and edit news stories, to broadcast documentaries, or to develop creative advertisements and public relations campaigns. It involves study of the substantive issues that need to be communicated as well as those that have already occurred.

Once students grasp the fundamentals of the liberal arts, they must seek more than the ability to communicate. They must also acquire ethical awareness because future journalistic work will have impact far beyond that of most occupations. A successful public relations practitioner or advertising executive must know where ethical advocacy of a product ends and hucksterism begins. The photographer-journalist and the editor must know where the presentation of fact ends and fabrication begins. It is in this realm, as well as that of substantive course work, that a faculty of high quality plays a major role.

When students enroll in the School of Journalism, they are guided by a faculty of fifteen full-time and three part-time professors who represent more than 100 years of cumulative journalistic experience. It is a faculty that represents the diversity of the school itself. The backgrounds and education of the teaching staff include professional experience with newspapers, the wire services, radio and television, public relations firms, and advertising agencies.

The School of Journalism works with students in writing courses to get their work published. Their articles frequently appear in the *Daily Athenaeum*,

student newspaper at WVU; in the *Morgantown Dominion-Post;* in *Take One,* the Journalism laboratory newspaper; in *Martin Monitor,* a public relations publication; in state and national publications; or on-the-air on WWVU-FM, the student radio station. Students have been named to Sears Congressional Fellowships in the nation's capital for one semester, to Magazine Publishers Association summer fellowships, and to legislative internships in the state capital. In addition, the School of Journalism maintains a working relationship with the *Daily Athenaeum* and WWVU-FM. Students serve as reporters and editors for the paper or radio station as an extracurricular activity. The School of Journalism also operates a newsroom to give students practical writing and editing experience, and one of the products is *Take One.*

Advanced students in photojournalism may receive practical experience as photographers for the *Daily Athenaeum,* as local stringers for Associated Press, and as part-time photographers for the WVU Office of Communications Services.

Advertising students find opportunities for practical experience by selling advertisements and servicing accounts for the *Daily Athenaeum* and other campus publications as well as by handling the paper's other business matters.

Students directing their studies toward production have an opportunity to become involved in both letterpress and offset projects in newspaper production laboratories. Those wishing to get involved in newspaper production have ample opportunity to become members of the *Daily Athenaeum* production staff; and they learn how to run the latest cold-type production equipment as well as how to paste up newspapers.

Public relations students generate and execute projects aimed at identifying and solving communications bottlenecks between local and statewide organizations and the public. They also serve internships during the summer and throughout the school year. Public relations and news-editorial majors participate in intern programs in the WVU Sports Information Office, and public relations and advertising majors gain valuable experience in case study competitions.

Because students write, edit, sell advertising, and even do the typesetting and page paste-up for the *Daily Athenaeum,* they may experience any facet of journalistic life they wish to pursue.

Students in the broadcast journalism sequence gain basic knowledge and entry-level skills in radio-television news in the introductory courses. They gather, write, edit and present the news, and use such learning aids as audio and video tape (both portable and studio), and film. They may build on that foundation both in the more advanced courses and through internships and similar work-and-study opportunities at the local PBS television station (WNPB-TV), WVU Office of Educational Telecommunications (EdTelCom), WVU Sports Information Office, WVU Extension and Public Service, and with commercial television and radio stations.

The School of Journalism also operates a summer program that places superior students in jobs with newspapers, magazines, radio stations, television stations, businesses, and industries for about ten weeks.

The School of Journalism is in renovated Martin Hall, WVU's oldest building (constructed in 1870). More than $1.8 million was spent on renovating, furnishing, and equipping the building in 1976-77. While the interior was completely modernized, the appearance of the exterior was maintained; the new annex on the west end of the building was constructed so that it would blend with the old.

The laboratories include electric typewriters, a video display terminal system, modern radio and television equipment, light tables, a photocomposition unit with more than 100 typefaces, photoenlargers, cameras, and equipment for independent study. In addition, there is a reading room with current newspapers, magazines, professional journals, and reference works.

Faculty

Professors

Paul A. Atkins, M.A. (U. Va.). Journalism history, Media law.
Donovan H. Bond, M.A. (WVU)—*Emeritus.*
John H. Boyer, Ph.D. (U. Mo.). Newspaper management, Media law, Women and the media.
Charles F. Cremer, Ph.D. (U. Iowa). Broadcast journalism principles, Technologies and practices.
Frank A. Kearns, B.A. (WVU)—*Emeritus.*
Hunter P. McCartney, Ph.D. (U. Penn). Public relations, Mass communications, Journalism history.
Robert M. Ours, Ph.D. (C. Wm. & Mary). Journalism history, Magazine writing, News and feature writing.
William O. Seymour, M.A. (E. Tex. St. U.). Photojournalism.
Guy H. Stewart, Ph.D. (U. Ill.)—*Dean.* Journalism history, Mass communications, Public relations.
William R. Summers, Jr., M.A. (U. Mo.). Retail advertising, Budgeting and planning, Direct marketing.

Associate Professors

David C. Coulson, Ph.D. (U. Minn.). Media law, Journalism history, Mass communications.
Harry W. Elwood, M.S. (Northwestern U.). News and feature writing.
C. Gregory Van Camp, M.S.J. (WVU). Broadcast journalism.

Assistant Professors

Harry W. Ernst, M.S.J. (Northwestern U.). Public information.
Patricia C. Findley, M.A. (Calif. St. U.). Reporting, Editing, Production.
Dennis R. Godfrey, M.A. (WVU)—*Adjunct.* Broadcast news, Public affairs.
Perry J. Irwin, M.S. (Iowa St. U.). Broadcast journalism, Diffusion of innovations, Professionalization of journalists.
Pamela D. Yagle, M.S.J. (WVU). Reporting, Language skills, High school publications.

Standing Committees

Academic Standards: Hunter P. McCartney *(Chair)*, Robert M. Ours, William R. Summers, Jr., and Pauline J. Dlhosh (student rep.).

Advisory/Planning: Guy H. Stewart *(Chair)*, Paul A. Atkins, John H. Boyer, Charles F. Cremer, Hunter P. McCartney, and William R. Summers, Jr.

Graduate Studies/Research: John H. Boyer *(Chair)*, David C. Coulson, Hunter P. McCartney, Robert M. Ours, and Jean Smith (student rep.).

Journalism Proficiency Examination: Robert M. Ours *(Chair)*, Patricia A. Findley, and Pamela D. Yagle.

Library: David C. Coulson *(Chair)*, Harry W. Elwood, and Perry J. Irwin.

Off-Campus Education: Pamela D. Yagle *(Chair)*, Patricia A. Findley, Perry J. Irwin, Charles McCann, William O. Seymour, Amy Cappellanti (student rep.), Tom Harman (student rep.), and Lori Jancart (student rep.).

Placement: Charles F. Cremer *(Chair)*, Charles McCann, Kathy Bentz (NE student rep.), Jeff Bair (NE student rep.), Susan Akers (PR student rep.), Suzanne Fitzpatrick (PR student rep.), Becky Sutor (ADV student rep.), Lori Jancart (ADV student rep.), Lynn Kessler (BN student rep.), and Harriett Godman (BN student rep.).

Scholarships: Harry W. Elwood *(Chair)*, Charles F. Cremer, and Patrick A. Trammelle (student rep.).

Teacher Evaluation: William O. Seymour *(Chair)*, Paul A. Atkins, and John H. Boyer.

Professional Advisory Committee

Visiting: Robert M. Rine *(Chair)*, Charles K. Connor, Jr., J. Ross Felton, L. P. Harvath, III, Roy G. Owens, John Purser, John C. Shott, James Swearingen, and Fred Young.

Accreditation

The School of Journalism is fully accredited by the Accrediting Council on Education for Journalism and Mass Communication (ACEJMC) for the unit (school) and five sequences—advertising, broadcast news, graduate professional, news-editorial, and public relations. ACEJMC approval is held by approximately 85 colleges and universities in the United States.

The quality of the school's programs has also been recognized by membership in the Association of Schools of Journalism and Mass Communication.

Professional Relations

A close and continuing relationship is maintained with the West Virginia mass media through the West Virginia Press Association, the West Virginia Press Women, the West Virginia Broadcasters Association, Public Relations Society of America (West Virginia and Pittsburgh Chapters), and an adjunct to the Press Association—the West Virginia Public Relations Associates. These groups have provided educational and financial support to the school.

In turn, the School of Journalism provides services to the professionals. Regional advertising seminars have been conducted for newspaper publishers and retail merchants, and workshops on newswriting have been conducted for state news people and stringer-correspondents of weekly newpapers. The school has provided science writing symposia and seminars on Appalachia, future of transportation, and interpretive vs. advocacy reporting for news people; it also has worked with the Public Relations Associates of the Press Association in establishing seminars. The school has assisted journalism teachers by sponsoring summer workshops and by working with their publications staffs during the school year.

Typewriting

Before or soon after entering WVU, a student planning to major in journalism should learn the touch system of typing. The student must be able to type 20 words per minute in order to take Journalism 15. From the beginning, all students in writing courses are expected to submit copy in neat, typewritten form.

Admission

To be admitted to the School of Journalism as a journalism major, a student must meet these requirements:

1. Must achieve at least a 2.0 in English 1 and 2. (See "Proficiency in English," below.)
2. Must complete Journalism 15 and Journalism 18, or equivalents, with at least a C grade in each course.
3. Must pass the School's Journalism Proficiency Examination.
4. Must complete Library Science 1 with a passing grade.

5. Must file for admission with the School of Journalism or the head of the sequence in which one wishes to study; application must be approved by the dean.

6. Must have successfully completed 58 or more hours (excluding F's) with an overall grade-point average of at least 2.0, with at least a 2.0 average in journalism courses; or, must have a 2.5 overall grade-point average if the student has already attempted 75 or more hours.

7. Must agree to complete at least 45 hours after being accepted by the School of Journalism.

Complete information concerning WVU admission, fees and expenses may be obtained in Part 2. Academic information is in Part 3.

Proficiency in English

Competence in writing is emphasized. A student who plans to major in journalism must achieve at least a 2.0 average or higher in English 1 and 2. In addition, students must pass the Journalism Proficiency Examination (JPE) administered in Journalism 15. If a student does not pass the JPE on one of two attempts in Journalism 15, he/she must pass the test during the first week of the next spring or fall semester he/she is enrolled at WVU. A student who plans to major in journalism may not enroll in additional journalism courses requiring Journalism 15 or 18 as a prerequisite before passing the JPE.

Journalism Organizations

Several organizations affiliated with the School of Journalism provide the opportunity for honor and recognition as well as for fellowship and education. They are:

Alpha Delta Sigma, scholastic advertising honorary.

American Advertising Federation, professional advertising fraternity.

Kappa Tau Alpha, national scholastic honorary for students with exceptional academic records in journalism.

Public Relations Student Society of America, national public relations professional organization.

The Society of Professional Journalists, Sigma Delta Chi, professional society for news and broadcasting majors.

Job Placement

The School of Journalism assists its graduates in finding desirable positions. It acts as a placement clearinghouse for current and past graduates, and it advises and assists students in the preparation of resumes.

Representatives of newspapers, magazines, public relations, broadcasting, and advertising frequently request the School of Journalism to provide applicants for their openings.

Bachelor of Science in Journalism (B.S.J.)

A candidate who has satisfied all general requirements of the University and has met the requirements of the School of Journalism will be recommended for the degree of Bachelor of Science in Journalism (B.S.J.), provided the combined numbers of credits acquired as a pre-journalism student and as a regularly enrolled journalism major totals no fewer than 128. *This total will not count non-translated courses from other colleges, any course repeated more than one time (such as Music 102), unless it represents a new and*

different learning experience, or Mathematics 2. While WVU frequently accepts all junior college credits, the School of Journalism follows the Accrediting Council on Education for Journalism and Mass Communication recommendation of accepting no more than 12 journalism credits from such institutions. While a student may take a number of multidisciplinary courses as electives, only one such 3-hour course will be allowed toward Core C.

In line with the national accreditation council and the school's philosophy on the ratio of professional journalism courses to courses in liberal arts, a degree candidate will take approximately one-fourth of the total hours in journalism. The minimum number of journalism hours will be 30, and the maximum number ordinarily will be 33. No fewer than 40 hours shall be obtained in courses numbered between 100 and 400. A student must complete at least 45 hours after admission to the School of Journalism.

A student may pursue another degree concurrently, but the candidate must plan the program with the deans of the two colleges or schools involved. To receive the second baccalaureate degree, the student must complete 158 credit hours. A student with one bachelor's degree also may seek a bachelor's degree in journalism. The student must plan the program with the dean.

A student within 12 hours of graduation in the last semester may elect to take one or more courses for graduate credit. However, the student must consult with his/her adviser.

Scholastic Requirements

To be eligible for graduation, a student must earn a minimum cumulative grade-point average of 2.0; concurrently, the journalism average and the average in the student's minor field must be at least 2.0. Courses totaling 15 hours in the minor field or 12 hours in each of two minors are counted toward the minimum 2.0 grade-point average.

No student will be recommended for the degree unless it has been shown to the satisfaction of the faculty that the student possesses abilities and qualifications that give promise of doing adequate work in professional journalism.

Independent Study/Waivers

The journalism faculty encourages students to take courses by examination and through independent study when the student's background and the nature of the courses lend themselves to such arrangements. The method of examination can be appropriate when students have in some way other than by class attendance learned the course content. Independent study may be undertaken in some courses with the consent and supervision of the professor. In unusual cases, a student may receive the Dean's permission to waive a course.

Probation/Full-Time Load

A student on probation shall not take more than 15 hours of course work in a semester, and the Committee on Academic Standards may require that the student not take more than 12 hours. No student may enroll for more than 18 hours in a single semester without petitioning the student's adviser.

Withdrawal From Class Or University

All students enrolled in journalism courses may withdraw from a course until the Friday of the tenth week of classes (see the University Calendar for

the date) with a grade of W. After that date, a student may withdraw only with approval of the Committee on Academic Standards, and then the student will be awarded a grade of W or WU.

Journalism majors who withdraw from the University after the tenth week of a semester will be automatically suspended from the School of Journalism for a minimum of one semester (not including a summer session). If a late withdrawal results from illness, the student must present a written excuse from a physician at the time of withdrawal to avoid automatic suspension.

Minor Field

To meet the requirements of a minor, a student must earn at least 15 hours in a subject other than journalism with no more than 3 hours in courses numbered under 100. Courses at the 100-level or higher, even when they can be taken more than once, ordinarily will be counted only one time. For students pursuing two minors simultaneously, the requirements in each area are at least 12 hours, of which no more than 3 hours can be numbered under 100. A student should consult the adviser about a minor.

Students from other major fields of study are permitted to minor in journalism, but they must take Journ. 15 and 18 and pass the Journalism Proficiency Examination in order to pursue most upper-division journalism courses.

Minor/Special Emphasis

Because many journalism majors need to know more and more about economics and business, a number of special business minors have been developed cooperatively with the College of Business and Economics. Students interested in such a minor should confer with their advisers. The faculty also has approved an international studies minor. Students interested in this minor should consult with their advisers.

Internship Credit

A number of internship opportunities for credit are available in the summer; to a lesser extent such credit is available during the academic year. All students interested in internship credit must apply for it and register *in advance* and establish a "contract" with the head of a sequence. This "contract" is essentially an agreement that spells out the terms under which credit will be given. It describes the kind of learning experience that will be involved, including assignments, reports, type of supervision, and the evaluation by a supervisor on the job plus a member of the school's faculty. Not more than 10 percent of a student's journalism credits (2-3) can be earned via internships in accordance with ACEJMC standards. Students who register for internships for three credit hours in the summer may register for one other course under certain conditions (see the dean or associate dean).

Advertising Curriculum

The advertising curriculum is designed to prepare students for careers in the creation, sales, management, and production of advertising.

Journ. 50, 113, 114, 203, and 239 are the basic advertising courses in the sequence. Everything else in advertising is founded on these courses.

Students develop a specialization in advertising in the junior and senior years. The specialization areas are: Copy (Journ. 114, 214); Media (Journ. 203, 204, 251); and Graphics (Journ. 110, 210).

The minor field is subject to approval of the adviser. Some approved minors are marketing, economics, management, finance, business law, general business, psychology, art, and speech communication.

Persons who are interested in practical application of advertising production problems should consider part-time employment in the offset production plant of the *Daily Athenaeum*, in addition to electing Journ. 210.

Students in advertising prepare for careers with advertising agencies, company advertising departments, retail advertising, promotion, and the media.

First Year

Journalism 1	3
Journalism 15	2
English 1	3
English 2	3
Core C	8
Humanities 1/2/3/4/5/10/11/191	6
Political Science 2	3
Elective	3
Library Science 1	1

Second Year

Journalism 18	3
Journalism 50	3
Journalism 113	3
English elective	3
Economics 51/100-level courses*	6
History 52/53	6
Political Science 120	3
Core C	4
Electives (recommended Psychology and Marketing)	6

Third Year

Journalism 114	2
Journalism electives**	5-6
Minor field	6
Electives	6-7
English elective	3
Political Science 120	3
Philosophy 1/10	3

Fourth Year

Journalism 203	3
Journalism 239	2
Journalism 299	2
Journalism electives**	5-6
Minor field	6
Electives (Theatre, Art, Music, Speech Communication, Sociology and Anthropology)	12-14

*Marketing minors must take Econ. 54/55.

**Advertising majors select one specialty area.

Broadcast News Curriculum

The broadcast news curriculum is supported by a complete teleproduction facility including television and radio studios and associated control room, video and audio tape assembly and editing area, and a videotape editing facility. However, the focus and the thrust of the instruction in the broadcast journalism curriculum stresses basic news writing, editorial judgment, and the principles as well as the practices of radio and television news.

Supported by a broad liberal arts background, the curriculum stresses an integration of news equipment familiarization, journalism principles and practices, legal aspects, journalism ethics, and professional standards and norms. Such a preparation helps students not only to develop their own communicative skills but also to develop an appreciation of radio, television, cable, and motion pictures as communicative and journalistic arts. Additionally, these studies challenge the student's ability to evaluate and criticize broadcast media functions, performance, responsibilties, and influence in society.

Students entering this program must pass a microphone check on the oral delivery of news.

Professional staff members of WVU's Office of Educational Telecommunications and WVU Extension and Public Service Radio-TV hold joint appointments and teach in some broadcast journalism courses.

Students seeking a career in the news and information area in broadcasting should pursue this curriculum. The student's minor field must be approved by the adviser.

First Year		Second Year	
Journalism 1	3	Journalism 18	3
Journalism 15	2	English electives	6
Journalism 117	3	History 52/53	6
English 1	3	Political Science 120	3
English 2	3	Core C	4
Elective	3	Electives	4
Core C	8	Economics 51/100-level courses	6
Humanities 1/2/3/4/5/10/11/191	6	Philosophy 1/5/10	3
Political Science 2	3		
Library Science 1	1		

Third Year		Fourth Year	
Journalism 185	3	Journalism 287	3
Journalism 186	3	Journalism 299	2
Journalism electives	3	Journalism electives	6
Minor field	9	Electives	14
Electives	11	Minor field	6

Journalism electives must be taken from the following list unless substitutions are approved by the adviser: Journ. 19, 111, 113, 120, 128, 189, 214, 227, 228, 285.

Journalism Education Curriculum

The School of Journalism has been working for a number of years with journalism teachers and administrators in West Virginia schools to improve journalism instruction and school publications. An even greater effort has been made over the past decade through regional high school workshops, critiques of school papers, the West Virginia High School Journalism Competition, and individual consultation with schools by members of the School of Journalism faculty.

One of the outgrowths of this cooperative effort has been a certification program in Journalism. The School of Journalism provides courses for that program in the WVU College of Human Resources and Education.

News/Editorial Curriculum

This curriculum is devoted to teaching fact-gathering, news and feature writing, and the various skills of editing. The sequence stemmed from the first courses offered in journalism at WVU.

Most news-editorial graduates have found employment with newspapers, magazines, and other publications or with the international press associations. This, in part, is because they have received excellent preparation for such careers in print media by working on the staff of the *Daily Athenaeum* and other newspapers. Other graduates, however, have gone into broadcasting or public relations or hold writing and editing positions in the professions, scientific fields, business, industry, and government.

As a condition of graduation, news-editorial students are required to have 75 or more column-inches of writing published in campus or off-campus news media.

News-editorial students most frequently minor in political science, history, or English. But it is becoming more common for them to select such areas as sociology and anthropology, psychology, speech communication, and economics.

First Year

Journalism 1	3
Journalism 15	2
English 1	3
English 2	3
Humanities 1/2/3/4/5/10/11/191	6
Core C	8
Elective	3
Political Science 2	3
Library Science 1	1

Second Year

Journalism 18	3
Journalism 19	3
Journalism 120	3
History 52/53	6
Economics 51/100-level courses	6
English elective	3
Science/Core C	4
Political Science 120	3
Electives	3-6

Third Year

Journalism 118	3
Journalism 128/220/227/230*	6
Minor (upper division)	6
Electives	15
English elective	3
Philosophy 1/10	3

Fourth Year

Journalism 228	3
Journalism 299	2
Minor (upper division)	6
Electives	10-13
Journalism electives	2-7

Journalism electives must be taken from the following list unless substitutions are approved by the adviser: Journ. 108, 110, 111, 113, 117, 130, 141, 185, 186.

*Because two of these courses are needed, one may be taken in the fourth year.

Public Relations Curriculum

Public relations offers practitioners challenging opportunities to align interests of organizations—industrial, educational, military, charitable—with those of their publics. WVU graduates are finding ready acceptance of their services.

The curriculum is organized to provide the student a comprehensive familiarity with all aspects of communications—written, spoken, and image—and with important concepts in the social sciences. The student learns to gather, interpret, and present information in the varied media of communications—newspapers, radio, TV, and specialized forms (brochures, reports, slides, speeches, etc.). Besides studying public relations the student learns

First Year

Journalism 1	3
Journalism 15	2
English 1	3
English 2	3
Psychology 1	3
Humanities 1/2/3/4/5/10/11/191	3
Science*	8
Library Science 1	1
Political Science 2	3
Foreign Language***	3
Mathematics 3	3

Second Year

Journalism 18	3
Journalism 19	3
Economics 54/55	6
English**	6
History 52/53	6
Philosophy 1 or 10	3
Speech Communication 11/14	3
Foreign Language***	3
Accounting 51	3

*Two science courses must be taken in sequence, e.g., Biol. 1 and 2 or Geol. 1/2 and 3/4.

**Two literature courses must be taken in sequence, i.e., Engl. 21 and 22 or Engl. 24 and 25.

***Two consecutive semesters of one foreign language must be taken.

Third Year		Fourth Year	
Journalism 111	3	Journalism 222/241	3
Journalism 121	3	Journalism 299	2
Journalism 124	3	Political Science 120	3
Psychology 101/151	3	Management 105	3
Statistics 101	3	English 150	3
Marketing 111	3	Minor electives	6
Minor electives	6	Electives	3-4
Computer Science 1/5	4	Journalism electives	4-7
Journalism electives	3-6		
Elective	3		

Journalism electives must be taken from the following list unless substitutions are approved by the adviser: Journ. 110, 113, 117, 118, 120, 220, 228.

principles of advertising, photography, typography and layout, programming, and organizational and management functions.

A public relations major is encouraged to select a minor that will provide a deeper understanding of personal and interpersonal relationships—e.g., political science, psychology, sociology and anthropology—or a minor that will enhance the projected area of practice, e.g., general business, education, or science.

Courses of Instruction in Journalism (Journ.)

1. *Introduction to Mass Communications.* I, II. 3 hr. *(Recommended for all University students.)* Mass communicator's role in developing political, social, and economic fabrics of a democratic society. Organization and function of newspapers, magazines, broadcast stations, and other principal media, including the role of advertising and public relations.

15. *Basic Journalistic Writing.* I, II, S. 2 hr. PR: Journ. 1 with a C or better grade or consent. Learn basic styles of journalistic writing in advertising, broadcasting, newswriting and public relations with strong emphasis on English grammar, punctuation and spelling. Passing the Journalism Proficiency Examination is a course requirement.

18. *News Writing.* I, II. 3 hr. PR: Journ. 15 with a C or better grade or consent. Essentials of fact-gathering; writing news and features; ethics and responsibilities of news reporting. Typing ability required. Also, an honors section and laboratories are available to students who have good writing ability. A permit is required for the honors section. Two lec. and a 2-hr. laboratory-demonstration period.

19. *Copy Editing and Make-Up.* I, II. 3 hr. PR: Journ. 18. Combination lecture laboratory twice a week for two hours, plus laboratory experience on the School's laboratory paper, *Take One.* Copy editing, headline writing, handling of wire copy, and make-up. Public relations sections emphasize make-up of internal publications.

50. *Visual Communication.* I, II. 3 hr. PR: Journ. 15. Graphic arts as a communication medium. Discussion of photography and typography with emphasis on basic techniques and aesthetics.

108. *The Community Newspaper.* I. 2 hr. *(Open to all University students.)* Fundamental problems and techniques in operation of community newspapers.

110. *Typography and Printing Processes.* I. 3 hr. Fundamentals of print production, including design and composition procedures for major printing processes; discussion and application of typographic aesthetics. *(Students must acquire tools for the course: cost about $5.00.)* One lec., 2 hr. lab.

111. *Introduction to Public Relations.* I, II. 3 hr. *(Open to all University students; required in the public relations curriculum.)* Introduces the student to the principles of public relations. Definition and historical development, opportunities and challenges, techniques and management of public relations are included.

113. *Principles of Advertising.* I, II, S. 3 hr. *(Open to all but freshmen.)* Advertising in the American economic system for national and retail advertisers. Study of individual advertising and media, copy and layout problems, appeals, research production, schedules, federal and state laws affecting advertising, and ethics. Practical laboratory work in writing and layout of advertising. Two lec., one 2-hr. lab.

114. *Retail Advertising.* I, II. 2 hr. PR: Journ. 50 and 113, or consent. Planning, preparation of newspaper advertising campaign for a daily newspaper, including supplementary assignments in radio copy, direct mail, outdoor advertising, and sales promotion. 2 hr. lec.

117. *Introduction to Broadcasting.* I, II, S. 3 hr. Survey of the broadcasting industry from the perspective of broadcast journalism, including historical development, federal regulation, industry codes, professional responsibilities, broadcasting research, and contemporary developments including cablevision.

118. *Advanced Reporting and Editing.* I, II. 3 hr. PR: Journ. 18 and 19. Development of a student's ability to cover and write spot news, public affairs and interpretative articles, and investigative stories. Laboratory work includes doing assignment sheets, editing stories and editing and makeup for the School's laboratory newspaper, *Take One.*

120. *Introduction to Photography.* I, II, S. 3 hr. Basic techniques of film developing and printing. Students are required to purchase their own film, enlarging paper, chemicals, and have access to a camera. *(The supplies cost approximately $60.00-80.00 per semester.)*

121. *Public Relations Research and Theory.* I, II. 3 hr. PR: Stat. 101, Journ. 18, 111. Explores various theories of public opinion formation; applies methods of measuring and analyzing public opinion for application to public relations programs for changing, maintaining, or crystallizing public opinion for socially acceptable causes.

124. *Public Relations Applications.* I, II. 3 hr. PR: Journ. 18 and 111. Applied principles of public relations enabling institutions to explain their activities and gain public support. (Weekly laboratory sessions in which students develop tools and techniques for these applications.)

128. *Reporting of Public Affairs.* II. 3 hr. PR: Journ. 18 or consent. Reporting local, state, and federal government activities and other public affairs. Visits to public agencies and training in spot news and depth reporting in public affairs.

130. *Advanced Photography.* I. 3 hr. PR: Journ. 120 or equiv., or consent. Designed to equip students to serve all communication media including magazines, newspapers, and television. A high level of competence is assumed at the outset. Course requirements include a portfolio (general or around a specific theme) and numerous weekly assignments.

141. *Advanced Journalism Problems.* I, II, S. 1-6 hr. For juniors and seniors. Intensive, independent study; to be approved by the dean.

185. *Broadcast Journalism 1.* I, II. 3 hr. PR: Journ. 18 and consent. Lecture-laboratory course oriented to radio news. Gathering, writing, editing, and presenting news for radio. Outside taping and studio taping, broadcasts; monitoring local and network newscasts. Emphasis is on writing news scripts and producing newscasts.

186. *Electronic Field Reporting.* I, II. 3 hr. PR: Journ. 185 and consent. Preparation and packaging of field reports for television news using ENG videotape technology. Methods of topic selection/evaluation/research; visual and script development; ethical/legal considerations.

189. *Newsfilm in Television.* I, II. 3 hr. PR: Consent. Planning, shooting, editing, and scripting of newsfilm for television newscasts. *(Film and processing cost about $50.00 per student.)*

203. *Advertising Media Analysis.* I. 3 hr. PR: Journ. 113 and senior standing, or consent. Buying, estimating, and scheduling of print and broadcast media. Preparation of media rationale for national campaigns based on research and statistical analysis and computerized data. Determination of advertising allocations; sales representation; promotion.

204. *Media Management.* II. 3 hr. PR: Journ. 113, 114, and 203 or consent. Planning of advertising appropriations in national and international print and broadcast media. Client, agency, and media responsibilities. Evaluation of advertising. Presentation.

210. *Graphic Design.* II. 3 hr. PR: Journ. 110 or consent. Design layouts for print media. Includes buying, supervising, and scheduling of art, typography, and print material. 2 hr. lec., 2 hr. lab.

214. *Advertising Copywriting.* I, II. 3 hr. PR: Journ. 50, 113 and 114 or consent. Copy concepts, copy platforms, techniques and strategies for print and broadcast media. Writing and production of broadcast commercials; preparation of a print national campaign. 2 hr. lec., 2 hr. lab.

220. *Writing for Magazines.* I, II, S. 3 hr. PR: Upper-division or graduate standing; Journ. 15 or equivalent preparation in grammar, punctuation, and spelling. Professional approach; magazine analysis, query letters, writing, rewriting; submitting manuscripts for publication.

221. *Public Relations Interning.* I, S. 3 hr. PR: Journ. 124. *(Open only to junior, senior, and graduate public relations majors.)* Student learns through on-the-job training. Course structured along a public relations agency organization and operations.

222. *Public Relations Case Studies.* II. 3 hr. PR: Journ. 124. Seminar based on in-depth studies of public relations programs developed and applied in support of our institutions. Primary emphasis on successful campaigns, but unsuccessful efforts also will be examined for causes of failure.

225. *High School Publications Advising.* II. (Alternate Years.) 3 hr. PR: Journ. 18, 19, 113. *(For students seeking Journalism certification.)* Emphasizes writing styles, newspaper/yearbook layout, rights and responsibilities of the teacher, students, and school system. Enrollees will construct instructional portfolios based on research and classroom discussion concepts. *(Course will not be offered in 1987-88.)*

227. *History of Journalism.* I. 3 hr. PR: Hist. 52 and 53 or consent. *(Open to all University students.)* Impact of the American press on the nation; development of today's media from the beginnings in seventeenth-century England and in the American colonies; great names in journalism; freedom of the press and its current implications.

228. *Law of the News Media.* II. 3 hr. *(For seniors and graduate students.)* The law as it affects the mass media. Considered are such areas as libel, privacy, public records, criminal pre-trial publicity, freedom of information, obscenity.

230. *Editorial and Critical Writing.* I. 3 hr. *(Open to all University students.)* The student will analyze and write commentaries; study typical editorial pages and the

ethics governing editorial page content; become familiar with libel, privacy, contempt, and other problems—operating and political—as they arise.

231. *Color Photography.* II. 3 hr. PR: Journ. 120 and 130 or consent. The theory of color slides and prints, including slide development, as applied to multi-media presentations. *(Supplies will cost $50.00-70.00.)*

239. *Seminar in Advertising Management Problems.* I, II. 2 hr. PR: Senior standing and major or minor in advertising. Application of the study of advertising research, law, and theory in the preparation of a national advertising campaign. Aspects of the campaign to cover marketing, research, creative, media, sales promotion, and presentation.

241. *Internship.* I, II, S. 2-3 hr. PR: Foundation courses in one of the sequences. Student must have a signed contract detailing terms of the learning experience. *(Graded on Pass/Fail basis.)*

251. *Direct Marketing.* II. 3 hr. PR: Journ. 113 and 114 or consent. Mailing, marketing, and creation of direct-mail letters, brochures, involvement pieces, and reply cards. Postal regulations, direct-mail law, and printing procedures.

285. *Special Topics in Broadcast Journalism.* I, II, S. 1-3 hr. PR: Journ. 186 and consent. Directed investigation of selected topics in broadcast journalism.

287. *Broadcast Journalism 2.* I, II. 3 hr. PR: Journ. 186 and consent. Continuation of Journ. 185, with course content oriented to television news, including electronic news gathering (ENG).

299. *Contemporary Media Issues and Ethics.* I, II. 2 hr. *(Required of all senior journalism majors.)* In-depth study of contemporary media issues such as right of access to media, morality in news and advertising, new FTC and FCC regulations, media responsibility to society, and social responsibility of media professionals. Individual research papers on issues with ethical considerations.

300. *Introduction to Graduate Studies.* I. (No Credit.) *(Required of all graduate journalism students.)* Designed to orient students to graduate study. (Class meets once a week.)

302. *Seminar in Communications Theory.* II. 3 hr. PR: Studies in human behavior. Communications theory drawing heavily on social psychology and sociology and anthropology. Philosophy of science. Theory as scientific knowledge. Characteristics of theory. Begin learning how to draw on experts, to apply theory.

304. *Mass Media and Society.* II. 3 hr. *(Required of all graduate journalism students.)* Study of mass media and their role in and influence on society; includes analysis of the social, political, and economic determinants of media content and character.

312. *Fund-Raising and Foundation Management.* I. 3-6 hr. *(Open to graduate journalism students and to seniors with a 3.0 grade-point average; consent.)* Seminar. Studies in fund-raising, alumni relations, and foundation management.

315. *Seminar in Journalism Education.* I, S. 1-3 hr. Journalism education problems. Each student does an individual research project planned to provide for professional development as a journalism teacher. Emphasis on secondary-school problems.

320. *Advanced Journalistic Writing and Research.* I, S. 3 hr. Study of advanced journalistic writing and research techniques. Students will practice the writing and research techniques on topics of their own choosing. Academic or popular topics will be selected.

337. *Eighteenth-Century Journalism.* II. 3 hr. Importance of British and American periodicals in the political, cultural, and economic patterns of the century;

especially emphasizes the role of Colonial journals in reducing regionalism and forging a nation.

340. *Corporate Communications.* I. 3 hr. Conferences to examine the synergistic effects of advertising, journalism, and public relations for different kinds of corporations. Team projects and presentations.

341. *Special Topics.* I, II, S. 1-6 hr. Student proposes idea for substantial reading, research, writing in area of interest; requirements may include conventional term paper, series of articles, slide presentation, oral presentations, etc. Student works independently of classroom setting.

343. *International Communications.* II. 3 hr. International news gathering and dissemination—including wire services, broadcast satellites, and political barriers—are examined, particularly as these factors affect a free exchange of information within the world community. Efforts by the United Nations to encourage news exchange and to lower news barriers will be a major case examination.

380. *Thesis.* I, II, S. 2-6 hr. PR: Approved thesis proposal.

390. *Professional Project.* I, II, S. 2-6 hr. PR: Approved professional project proposal. Non-thesis professional project for students preparing for some field in mass communications.

School of Medicine

The curriculum for the degree of Doctor of Medicine (M.D.) is described in the *WVU Medical Center Catalog.*

Medical Technology

The undergraduate program in medical technology is under the administration of the School of Medicine. Students are admitted into the program leading to a Bachelor of Science degree after the completion of two years of premedical technology in an accredited college or university. The WVU Medical Technology Program is accredited by the Committee on Allied Health Education and Accreditation of the American Medical Association. Graduates are eligible for certification by the Board of Registry of the American Society of Clinical Pathologists (ASCP) and by the National Certification Agency for Medical Laboratory Personnel (NCA).

The undergraduate curriculum includes the premedical technology program, which is offered in the WVU College of Arts and Sciences and at Potomac State College in Keyser and the medical technology program which is offered in the School of Medicine.

Courses of the first two years (premedical technology) may be taken in any institution of recognized standing that offers the courses required for admission into the medical technology program.

Since the course of study of the last two years is of a professional nature, students must be enrolled in the WVU School of Medicine for this entire period. The work of the junior year (the first year in the medical technology program) includes courses which introduce the student to the medical sciences and courses which prepare the student for the work of the senior year. During the senior year (the second year in the medical technology program) the student receives both didactic instruction and practical experience in the University Hospital laboratories.

Aim and Purposes

The primary aim of the program in medical technology at West Virginia University is to provide a strong undergraduate educational program in medical technology which leads to a bachelor of science degree and which provides an educational background compatible with the demands placed upon the medical technologist by the ongoing technologic revolution in laboratory medicine.

The purposes are: (1) to provide a program in medical technology which meets the academic standards of the University; (2) to provide graduate medical technologists for clinical, public health, and research laboratories; (3) to provide an educational background which enables graduates to prepare for teaching and supervisory positions in medical technology; and (4) to provide an educational background acceptable for graduate work in the medical sciences.

A program is available for certified medical technologists, who desire to complete requirements for a Bachelor of Science degree. (Further information may be obtained by contacting the Medical Technology Programs Office.)

Admission

Application for admission into the junior year (first year in the undergraduate medical technology program) should be made before the beginning of the second semester of the sophomore year in college. *Students at WVU or Potomac State College are not transferred automatically from the preprofessional course (first two years) to the professional course (third and fourth years.) Students are selectively admitted to the program for their final two years of work.*

Application forms for admission to the professional course are available after December 1 from the office of the Assistant to the Director of Admissions and Records, WVU Medical Center, Morgantown, WV 26506. These forms should be completed and returned to that office no later than February 15, if the student expects to enter the succeeding first semester classes.

Admission to the third year is on the recommendation of the Admissions Committee to the Dean. A personal interview with the committee is required.

Because of the large number of applicants and limited openings available in WVU Medical Center programs, preference in admissions is given to qualified West Virginians although outstanding nonresident applicants will be considered. Careful consideration is given to those personal qualifications which bear upon fitness of applicants for the study and practice of the profession.

Admission Requirements

Complete information concerning WVU admission, fees and costs, registration, regulations, etc. may be found in the *WVU Undergraduate Catalog.*

Admission requirements for the first year (premedical technology) are those for the College of Arts and Sciences.

Admission to the third year (first year of the medical technology program) is based upon two years of college work with a total of 62 hours as follows:

English. 6 hours. (Composition and rhetoric.)

Biological Science. 8 hours. (General biology or general zoology.)

Chemistry. 15-16 hours. (Inorganic chemistry, 8 hours; analytical chemistry, 3-4 hours; organic chemistry, 4 hours.) (Transfer students are required

to have a complete course in organic chemistry to include aliphatic and aromatic compounds, 8 hours.)

Physics. 8 hours.

Mathematics. 3 hours. (College algebra is the minimal course requirement.) Trigonometry, or a higher mathematics course, is recommended.

Electives to complete the required hours and to meet WVU Core Curriculum requirements.

Courses such as bacteriology, parasitology, and anatomy should not be taken until after the completion of the sophomore year. A foreign language is recommended for students who plan to do graduate work.

Degree

The degree of Bachelor of Science in Medical Technology is granted to those students who have completed the prescribed curriculum and who have been recommended for the degree by the faculty of the School of Medicine.

Admission, Curriculum, and Courses

For *complete information* concerning admission, curriculum, and courses of instruction in Medical Technology, see the *WVU Medical Center Catalog.*

Division of Physical Therapy

The Division of Physical Therapy, under the auspices of the School of Medicine, offers the final two years of a baccalaureate program leading to a degree in physical therapy.

The first two years of study may be completed in the WVU College of Arts and Sciences, or any other accredited institution which offers courses comparable to the admission requirements of the Division of Physical Therapy. To be eligible for a degree, a student must complete the final two years of the curriculum at WVU.

Admission to the third year is based upon 62 or more credit hours of study which satisfy the University's Core Curriculum requirements and the prerequisites, or their equivalent, of the Division of Physical Therapy. *Registration in the first two years does not automatically assure the student a place in the junior class. A student will be accepted on a competitive basis and selection will be based on scholastic standing and on those personal characteristics which are desirable in physical therapists.*

The student must satisfactorily complete a three-month period of clinical internship before the awarding of the baccaluareate degree. Expenses incurred during this time (room, board, and transportation) must be borne by the student. A Certificate of Proficiency in Physical Therapy then will be awarded which entitles the graduate to seek membership in the American Physical Therapy Association and to become eligible for state licensure for the practice of physical therapy. A physical therapist can practice professionally only after having passed the state board examination in the state where employment is desired.

Admission to Professional Program

A personal interview with the Admissions Committee is required. *Only those students who have at least a 2.6 grade-point average and a 2.75 science average (on a 4.0 scale) and who will have completed all the prerequisites*

(with a C or better) of the Division of Physical Therapy by the current Spring Semester will be interviewed. In addition to satisfying the prerequisite and Core Curriculum requirements, the applicant to physical therapy must also have: (1) volunteer or work experience in physical therapy and (2) scores on the Allied Health Professions Admission Test (given at major universities) which must be submitted to the Division. The Admissions Committee will advise the applicant of the time and place for the interview. Individuals who do not meet the above requirements but who believe extenuating circumstances justify admission may petititon the Admissions Committee for an interview. Reasons why the application should receive special consideration should be clearly stated in the petition.

Offical enrollment forms are available at the office of the Assistant to the Director, Admissions and Records, WVU Medical Center, Morgantown, WV 26506, beginning December 1 of each year. Application forms should be returned no later than March 1 in the year admission is desired.

Because of the large number of applicants and limited openings available in WVU Medical Center programs, preference in admissions is given to qualified West Virginians although outstanding nonresident applicants who have attended West Virginia schools or colleges or have other State ties will be considered.

Curriculum and Courses

For complete information concerning the curriculum and courses of instruction in Physical Therapy, see the *WVU Medical Center Catalog.*

Division of Military Science (ROTC) and Division of Air Force Aerospace Studies (ROTC)

West Virginia University offers qualified applicants two- and four-year courses of instruction in Military Science (Army ROTC) and Air Force Aerospace Studies (Air Force ROTC). Normally, successful completion of one of these courses and degree requirements leads to a commission as a second lieutenant in the U.S. Army or the U.S. Air Force.

Equivalent credit for part or all the four basic semesters of ROTC may be granted in accordance with existing military service regulations. This credit will be awarded on the basis of: prior active military service, high school ROTC, military school (Army ROTC at high school level), attendance at service academies, junior college senior division Army ROTC, or Civil Air Patrol training.

Deposit

Each ROTC student is required to pay a yearly deposit of $20.00 to cover any loss or damage to issued property in the student's possession. The deposit is paid to the WVU Controller at time of registration and is refunded upon return of undamaged property. (Army ROTC refunds the full amount if the property is returned undamaged. Air Force ROTC refunds the full amount if the property is returned undamaged and the uniform freshly cleaned as well.) Army ROTC Cadets may purchase their Class A uniforms upon successful

completion of the program. Air Force ROTC Cadets (seniors) may purchase their uniforms for one-half of the actual price upon completion of the program.

Wearing of the uniform is not required for the Army ROTC basic course.

Military Science (Army ROTC)

The Military Science program at West Virginia University is designed to provide: a reserve corps of scholars, citizens, and soldiers; graduates qualified in leadership and management skills, and prepared for public service; and men and women trained to assume responsible positions as commissioned officers in the active army, army reserve, or national guard, as well as business, government, and industry.

Whether or not the student elects to take only two years of the program while at the University, for which there is no service obligation, or remain for the full four-year program to become an officer, the student is better prepared to make a meaningful contribution in the preservation of American ideals and national security. There are no uniform or haircut requirements for Army ROTC basic course cadets.

Faculty

Jerald W. Fisher, Lt. Col., M.A., *Professor of Military Science.*
Lawrence C. Brown, Maj., B.S., *Associate Professor of Military Science.*
Charles D. Betoney, Capt., M.A., *Assistant Professor of Military Science.*
Derwent O. Daniel, Capt., B.S., *Assistant Professor of Military Science.*
James D. Hardin, Capt., B.S., *Assistant Professor of Military Science.*
Michael D. Skaggs, Capt., M.A. *Assistant Professor of Military Science.*
Melvin Barnwell, M.Sgt., *Chief Instructor.*
Donald L. Cumpston, Sgt. 1st Class, *Principal Drill Instructor.*
Janie M. Hart, S.Sgt., *Administrative Sergeant.*
Teddy R. Bailey, S.Sgt., *Supply Sergeant.*

Scholarship Program

Competitive scholarships are available for two, three, and four years. The government will pay for tuition, fees, and an allowance for textbooks. Additionally, the scholarship student receives $100 per month, tax free, during the academic year as a subsistence allowance. Candidates for the two-and three-year scholarships do not have to be enrolled in Military Science, but must be qualified to enroll. Additional scholarships are available for nursing students and enlisted members of the U.S. Army Reserve or U.S. Army National Guard. Four-year scholarship competition is for high school students only. High school counselors have application forms, or write to: Professor of Military Science, Stansbury Hall, West Virginia University, Morgantown, WV 26506.

United States Military Academy, West Point

Outstanding Army ROTC students may be recommended by the Professor of Military Science for ROTC nomination to the United States Military Academy at West Point. The student must meet all academy entrance requirements before being eligible for nomination.

Basic Course (Freshmen and Sophomores Only)

The Basic Course of instruction is for freshman and sophomore students who desire to investigate the possibilities of future government service

without committing themselves to a military service obligation. The basic course class may be added or dropped as any other courses in the University. Credits earned in ROTC count toward lower-level academic requirements. Additionally, the student gains a social awareness and develops personal values important in civilian life. Uniforms are not required in the basic course.

Army ROTC—First Year (Mil. S.)

1. 2 hr. The organization and development of the U.S. Army and ROTC from its inception to the present. The structure and role of the U.S. defense establishment with emphasis on the broad range of American civil-military relations.

2. 2 hr. The development of American military institutions, policies, experience, and traditions in peace and war are discussed. Past wars are examined in the perspective of modern military thought.

Army ROTC—Second Year (Mil. S.)

3. 2 hr. Introduction to basic leadership and management with emphasis on the fundamental concepts and skills required of today's citizen-soldier.

4. 2 hr. Continued instruction in basic fundamentals of leadership and management, with emphasis on the military application of these fundamentals. Introduction to small-unit tactics and organization.

Advanced Course (Juniors-Seniors-Veterans)

Selected students may participate in Advanced ROTC. It is required of all students who have an ROTC scholarship. Successful completion of the advanced course means earning a reserve commission as a second lieutenant in one of the fifteen branches of the Army which require over 300 occupational skills.

Advanced Course Allowances

Advanced Course students without an ROTC scholarship are given the same subsistence allowance as scholarship students. This allowance provides the student with $100 per month during the academic year.

Army ROTC—Third Year (Mil. S.)

105. 3 hr. PR: Basic course or equiv. (Equivalent credit may be granted by the WVU Director of Admissions and Records and the Professor of Military Science on the basis of prior military service, or ROTC training other than courses in military science taken at WVU.) Examines the requirements for military training and the psychological and technical aspects of effective instruction. Additionally, the military career system and the occupational specialties options available are reviewed.

106. 3 hr. PR: Mil. S. 105 or consent. Race relations/drug abuse seminars are conducted to familiarize students with the leadership techniques involved in coping with these unique social problems. Additionally, practical training is conducted in squad- and platoon-level tactics. The course is designed to prepare the student for Advanced Camp.

Advanced Summer Camp

Before a student can be comissioned, the student must attend an advanced summer camp of 6 weeks' duration, between the junior and senior

years. Cadets receive travel allowances and pay equal to one-half the basic pay of a second lieutenant. The most recent amounted to over $860.

Army ROTC—Fourth Year (Mil. S.)

107. 3 hr. PR: Mil. S. 105 and 106 or consent. Stresses the responsibilities of an officer and affords leadership experience as a cadet leader. Military staff procedures, military law, and military organizations, which prepare the student for future service, are studied.

108. 3 hr. PR: Mil. S. 107 or consent. Advanced leadership techniques, unit operations, and personnel management problems are discussed in seminars. The military role in United States foreign policy and world affairs is examined.

Leadership Laboratory

Freshman-Sophomore

Leadership training for freshman and sophomore students is designed to be challenging and adventurous. It provides opportunity for students to participate in action-oriented activities which develop self-confidence and self-discipline while encouraging the emerging leader. Rappelling, cross-country skiing, land navigation, and orientation visits to U.S. Army installations are some of the student's choices for participation. An average of one hour a week is required.

Junior-Senior

Leadership instruction is applied by the student in a working laboratory environment. Emphasis is placed on small-unit tactics, drill and ceremonies, physical training, rifle familiarization, and preparation for Advanced Summer Camp.

Two-Year Program (Sophomore and Transfer Students)

Selected students who apply will be enrolled in a two-year program that leads to an Army commission. The two-year student will attend a six-week Basic ROTC Camp. Upon successful completion of this requirement the student may enter the Advanced ROTC Program and complete the requirements for an Officer Commission during the two remaining years in school. Transfer students desiring to enter this program should contact the Professor of Military Science, Stansbury Hall, West Virginia University, Morgantown, WV 26506, before March 31 when planning on entering the University in the First Semester. WVU sophomores considering participation should contact the Army ROTC office early in the Second Semester.

Military History

Contracted students must take History 111 (Special Topics), *Introduction to Military History*. The class will explore military history from the seventeenth century to present and will include a study of major world wars and military alliances in the post-war era. (Offered Second Semester only.)

Physical Conditioning

Students may voluntarily attend for University credit, the Physical Education offering, *Military Physical Conditioning*, which is conducted at 6:30 a.m. on Mondays and Thursdays by the Army ROTC staff.

Airborne Training

Selected cadets may voluntarily attend airborne training at Fort Benning, Georgia. Airborne training is three weeks in length; successful completion of the course results in the award of the airborne wings of a military parachutist.

Air Assault Training

Selected students voluntarily attend air assault training at Fort Campbell, Kentucky. Airmobile training is 10 days in length; successful completion of the course results in the award of the Air Assault Badge.

Veterans Program

Qualified veterans with six months or more of active military service, who are WVU students may receive college credits for the first two years of Army ROTC. They may immediately enter the Advanced Course if they were contributing to the Veterans Educational Assistance Program while on active duty, or they have 12 hours of college credit with a 2.0 grade-point average or better.

Aerospace Studies (U.S. Air Force)

The Air Force officer education program at WVU has been in existence since 1946 and is designed to provide training that will develop managerial skills and interpersonal attitudes vital to the professional Air Force officer. It is designed to qualify those college men and women for commissioning who desire to serve in the U.S. Air Force. West Virginia University has the only Air Force ROTC (AFROTC) detachment in West Virginia.

Faculty

John N. Sims, Col., M.B.A., *Professor.*
Charles G. Carney, Capt., M.S., *Assistant Professor.*
Gerald B. Stout, Capt., M.S., *Assistant Professor.*
Kevin G. Boggs, Capt., M.Ed., *Assistant Professor.*
Michael L. Riggs, S.Sgt., *Non-Commissioned Officer-in-Charge.*
Robert A. Hilling, Sgt., *Administration Specialist.*
Curtis Foy, Sgt., *Personnel Specialist.*

Scholarship Program

Outstanding students from any academic discipline may apply to and be accepted by the Professor of Aerospace Studies to compete for scholarships under this program.

A large number of scholarships are available for students majoring in an engineering, scientific, or mathematical field.

For students awarded scholarships the government will pay for tuition, fees, and textbooks, as well as provide a $100 monthly allowance.

Scholarships of this nature are available for 2, 2½, 3, and 3½ years.

Benefits

Enrolling in Air Force Reserve Officer Training Corps (AFROTC) provides the opportunity to:

1. Earn at least 8 hours of academic credit which can be applied toward the requirements of any undergraduate major at WVU.

2. Compete for AFROTC scholarships that pay full tuition, fees, required books, and $100 per month (tax free).
3. Receive free career counseling from full-time campus representatives.
4. Go on field trips to Air Force installations in the United States.
5. Try AFROTC during freshman and sophomore years without obligation.
6. Develop leadership and managerial skills in the various corps projects.
7. Compete for entry into the Professional Officer Course (POC) and earn an Air Force commission.
8. Travel, on a space available basis, aboard government aircraft (POC and scholarship cadets only).

Distinguished AFROTC Graduate

The Professor of Aerospace Studies may designate as a Distinguished Graduate a POC member who:

1. Demonstrates superior academic and field training performance.
2. Possesses outstanding qualities of leadership and high moral character.
3. Demonstrates clearly exceptional leadership in recognized campus activities.

Distinguished graduates normally compete nationally for Regular Officer commissions.

U.S. Air Force Academy

The WVU President may annually nominate five outstanding AFROTC students to the U.S. Air Force Academy. Applicants for nomination are recommended by the Professor of Aerospace Studies to the WVU President during January of each year.

Veterans Program

Veterans with 180 days or more of continuous active duty military service may receive college credit for the first two years of Air Force ROTC and compete for entry into the POC.

Curriculum

The curriculum in Air Force Aerospace Studies is divided into three distinct areas: General Military Course, Leadership Laboratory, and Professional Officer Course. In addition, each cadet must take and successfully complete a course in English composition, (satisfied by English 1 and 2), or its equivalent, before completing the General Military Course. Also, prior to graduation and commissioning, each cadet must complete a course in mathematical reasoning. Scholarship cadets must take one semester of a major Indo-European or Asian language prior to graduation.

Leadership Laboratory

Leadership Laboratory is taken an average of one hour per week throughout the student's enrollment in AFROTC. Instruction is conducted in an organized cadet corps with a progression of experiences designed to develop each student's leadership potential. Leadership Laboratory involves a study of Air Force customs and courtesies; drill and ceremonies; career opportunities; and the life and work of an Air Force junior officer. Students develop leadership potential in a practical, supervised training laboratory, which typically includes field trips to Air Force installations throughout the United States.

General Military Course (GMC)

The Air Force course of study offered during the freshman and sophomore years is the General Military Course (GMC). This is composed of one class hour and one leadership laboratory hour per week. Two credit hours are allowed for each semester course successfully completed. Four semesters of the GMC is one method of competing for admission to the POC. However, a two-year POC option is available for those students who do not complete the GMC.

GMC—First Year (AFROTC) (AFAS 1 & 2)

1. 2 hr. The Air Force in the contemporary world through a study of the total force structure, strategic offensive and defensive forces, general purpose forces, aerospace support forces and separate operating agencies. (Also includes Leadership Laboratory as described above.)

2. 2 hr. Continuation of AFAS 1.

GMC—Second Year (AFAS 3 & 4)

3. 2 hr. The development of air power from dirigibles and balloons through the peaceful employment of U.S. air power in relief missions and civic actions programs in the late 1960's and the air war in Vietnam; leadership and managerial communicative skills are stressed by having students prepare both written and oral presentations. (Also includes Leadership Laboratory as described above.)

4. 2 hr. Continuation of AFAS 3.

Professional Officer Course

The Professional Officer Course (POC) corresponds to the junior and senior years of a student's academic program. Enrollment in the advanced course also is open to graduate students if they have four semesters of school remaining.

The POC is designed to provide highly qualified junior officers for the U.S. Air Force. Enrollment is based on such factors as leadership, scholarship, physical qualifications, and academic major. Successful completion of the advanced course qualifies the student for appointment as a second lieutenant in the U.S. Air Force upon receipt of a college degree.

Instruction averages three hours per week throughout the four semesters, plus Leadership Laboratory. Three hours of credit are allowed for each of the four semesters of work in the advanced program subsequent to acceptance by a school or college in the University.

To be eligible for enrollment into the POC, students must meet the following requirements:

1. Make application for the POC as soon as possible (usually during the sophomore year), taking into consideration the following items:
   a. Have a 2.0 cumulative grade-point average.
   b. Have two years (4 semesters) of undergraduate or graduate studies remaining.
   c. Be under 30 years of age at the time of commissioning, except that pilot and navigator applicants must not be older than 26½ years when commissioned.
2. Pass the Air Force Officer Qualifying Test.
3. Pass an Air Force medical examination.
4. Be accepted by the Professor of Aerospace Studies for one of the Air Force career specialities available.

5. Complete the GMC and/or Field Training (4 weeks for 4-year applicants; 6 weeks for 2-year applicants).

6. Agree to accept a commission as a second lieutenant in the USAF and serve at least four years if not on flying status, or five years after completing navigator training, or six years after completing pilot training.

POC—Third Year (AFROTC) (AFAS 105 and 106)

105. 3 hr. PR: GMC or equiv. (Equivalent credit may be granted by WVU Director of Admissions and Records and the Professor of Aerospace Studies on the basis of prior military service or ROTC training other than courses in Aerospace Studies and 6 weeks Field Training.) Course focuses on leadership, management, and the progressive development of communicative skills needed by junior officers. It emphasizes the individual as a manager in the Air Force. Individual motivational and behavioral processes, leadership, communication and group dynamics are covered to provide a foundation for the development of the junior officers' professional skills. Organizational power, politics and managerial strategy and tactics are discussed within the context of business and military organizations. Students will make field trips, prepare individual and group presentations for class, write reports, and participate in group discussions, seminars, and conferences. (Also includes Leadership Laboratory as previously described.)

106. 3 hr. PR: AFAS 105. Continuation of AFAS 105.

POC—Fourth Year (AFAS 107 and 108)

107. 3 hr. PR: AFAS 105 and 106. The course is a study of U.S. national security policy which examines the formulation, organization, and implementation of national security; context of national security; evolution of strategy; management of conflict; and civil-military interaction. It also includes blocks of instruction on the military profession/officership and the military justice system. The course is designed to provide future Air Force officers with a background of U.S. national security policy so they can effectively function in today's Air Force.

108. 3 hr. PR: AFAS 105, 106, 107. Continuation of AFAS 107.

AFAS 105, 106, 107, and 108 may be taken out of sequence, if unusual circumstances warrant and the student has received Professor of Aerospace Studies approval.

College of Mineral and Energy Resources

Mineral engineering graduates enjoy a multitude of career opportunities in our nation's most vital industries as the demand for well trained professionals in the various specialization areas continues to be very strong. As minerals and fossil fuels become more scarce, international politics force a greater emphasis upon self reliance in these areas and the mineral engineer's role will continue to grow in significance and importance.

Mining engineering is the profession which is responsible for the extraction of solid fuels and minerals, such as coal, oil shales, precious metals, and ores of iron copper, aluminum, and uranium, etc., from the earth's crust in ways which protect the environment and the people involved while allowing maximum recovery of our non-renewable natural resources.

Petroleum and natural gas engineering students are trained in the finding, drilling, production, and transportation of oil and natural gas. Emphasis is on the maximum development of these valuable resources in West Virginia, the nation, and the world.

Mineral processing engineering is a broad field that encompasses all areas involving the handling and treatment of ores, minerals, and solid fuels after extraction from the earth's crust to prepare them for marketing or further use. Topics studied include coal cleaning and preparation, energy conversion processes, environmental and economic concerns, mineral beneficiation, and extractive metallurgy.

Mineral resource economics studies the economics of the mineral industries, commodity markets, and the economic evaluation of resources in their broader aspects as affected by engineering technology, earth sciences, and national policy. Thus it ties together the geology of resources, the engineering of extraction and conversion processes, and the demands of industrial societies through mineral markets and trade. The particular strength of this discipline is the use of models which can analyze mineral policy impacts and provide forecasts of future mineral related economic behavior.

The College of Mineral and Energy Resources is in close proximity to major industrial, mining, and petroleum and natural gas producing areas. A number of the largest coal, oil, and gas companies throughout the nation provide meaningful and financially rewarding summer employment for students enrolled in the college's programs. These training opportunities have often led to professional positions upon graduation. The college has cooperative programs with several companies which permit the students to attend WVU one semester and work for the company the other semester. The money earned is sufficient in most cases to cover a student's educational expenses.

Faculty

Administrative Officers

John L. Schroder, Jr., M.S.E.M. (WVU), *Dean.*
Royce J. Watts, M.S. (WVU), *Associate Dean—Administration.*

Mining Engineering

Professors

Lawrence Adler, Ph.D. (U. Ill.). Mine machinery, Mine design.
Kenneth K. Humphreys, M.S.Ch.E. (WVU)—Minerals. *Adjunct.* Cost engineering, Coal preparation, Energy constant analysis.
Jay H. Kelley, Ph.D. (Penn St. U.)—*Distinguished.* Mine equipment, Mining exploration, Coal handling and shipping.
Syd S. Peng, Ph.D. (Stanford U.)—*Chair.* Ground control, Longwall mining, Respirable dust.
Ronald R. Rollins, Ph.D. (U. Utah). Explosive applications, Explosives theory.
Y. J. Wang, Ph.D. (Penn St. U.). Mine ventilation, Computer application, Mine design.

Associate Professors

Donald M. Bondurant, M.S.E.M. (WVU). Surface mining, Mineral evaluation.
Patrick R. Esposito, Ph.D. (WVU)—Minerals. Minerals operation research.
Robert Glenn, M.P.H. (U. Minn.)—*Adjunct.* Miner health inspection administration.
A. Wahab Khair, Ph.D. (Penn St. U.). Rock mechanics, Ground control.
Joseph D. McClung, M.S.E.M. (U. Pitt)—*Emeritus.*

Assistant Professor

W. H. Su, Ph.D. (WVU)—*Research.* Ground control, Geophysical methods.

Instructor

R. Larry Grayson, M.S.E.M. (WVU)—*Research.* Mine management/ventilation, Health and safety.

Petroleum and Natural Gas Engineering

Professors

James A. Wasson, M.S.P.N.G. (Penn St. U.). Reservoir engineering, Enhanced oil recovery.

Larry Woodfork, A.M. (Ind. U.)—*Adjunct.*

Associate Professor

Samuel Ameri, M.S. Pet.E. (WVU)—*Chair.* Geophysical well log interpretations, Reservoir engineering, Design and application.

Assistant Professors

Khashayar Aminian, Ph.D. (U. Mich.). Natural gas engineering, Reservoir simulation.

Robert W. Chase, Ph.D. (Penn St. U.)—*Adjunct.* Natural gas engineering.

Peter S. Puon, Ph.D. (U. Alberta). Drilling engineering, Enhanced oil recovery.

John P. Yu, Ph.D. (U. Okla.). Oil and gas property evaluation, Fracturing, Reservoir and production system design.

Mineral Processing Engineering

Associate Professors

Eung Ha Cho, Ph.D. (U. Utah). Hydrometallurgy, Environmental science.

Richard B. Muter, M.S. (WVU)—*Acting Chair.* Coal cleaning and preparation, Coal-waste utilization, Coal and mineral analysis.

Felicia F. Peng, Eng.D. (Stanford U.)—*Research.* Coal preparation/conversion, Environmental science.

Mineral Resource Economics

Professors

Walter C. Labys, Ph.D. (U. Nottingham). Commodity modeling and forecasting, Mineral trade, Mineral resource development.

William H. Miernyk, Ph.D. (Harvard U.)—*Benedum.* Economics. Regional development, Input-output analysis, Energy economics.

Adam Z. Rose, Ph.D. (Cornell U.). Energy resources and regional development, Natural gas economics, Input-output analysis.

Associate Professor

Thomas F. Torries, Ph.D. (Penn St. U.)—*Chair.* Mineral resource evaluation, Mineral policy, Coal economics.

Mining Extension Service

Associate Professors

Robert L. Halstead, B.S. (U. Charleston, WV). Mine foreman training, Electrical training, Production technology.

Thomas L. Savage, B.S. (Cornell U.)—*Associate Director.* Mine management training, Hydraulics.

Assistant Professors

Cynthia M. Bindocci, Ed.D. (WVU). Training material development, Women in coal industry, Historical research of mining tools.

Joseph C. Dorton, B.S. (Concord C.). Mine foreman training, Electrical training, Mandatory miner training courses.

James H. Kincaid, B.S. (WV Tech). Mine foreman training, Surveying, Mine ventilation.

Michael J. Klishis, Ph.D. (WVU). Miner training, Curriculum development.

Lecturer

G. Douglas Elliott, Ed.D. (WVU). Mine safety and health, Mine management.

Mining Extension Agents

David L. Arritt, M.S. (WV COGS). Mine foreman training, Mine management, Mine maintenance.

Thomas W. Hall, B.S. (Fairmont St. C.). Mine foreman training, Mandatory miner training courses, Mining methods.

William E. Moser, B.S. (Robt. Morris C.). Mine rescue/safety.

Particle Analysis Center

Professor

Thomas P. Meloy, Ph.D. (MIT)—*Benedum.* Powder science, Mineral liberation, Plant circuit analysis.

Assistant Professor

Nigel N. Clark, Ph.D. (Natal U.)—*Research.* Multiphase flows, Particle shape analysis, Fluidization.

ABET Accreditation

The Accreditation Board for Engineering and Technology (ABET), a joint body concerned with the enhancement of the status of the engineer and the engineering profession, has been designated by the professional engineering societies as the coordinating agency for the accreditation of undergraduate engineering curricula in the United States. The mining engineering curriculum is fully accredited by the ABET.

Admission

General Requirements

All prospective students must be qualified for admission to WVU and present secondary school credits for 2 units of algebra, 1 unit of geometry, ½ unit of trigonometry or advanced mathematics; and 1 unit of chemistry.

Additional freshman-year admission requirements for West Virginia residents and out-of-state residents, plus special admission policies for transfer students, are noted below. Admission policies vary between the Mining and Mineral Processing Engineering program and the Petroleum and the Natural Gas Engineering program.

Mining and Mineral Processing Engineering

First-Year Students

All applicants must take the Standard ACT test and submit official copies of ACT test scores to the Office of Admission and Records before an admission decision will be made. (See page 13 concerning SAT scores.) An automatic admission to the College of Mineral and Energy Resources will be based on the following:

West Virginia Residents: Achievement of a Standard ACT Mathematics score of 24 or better *or* achievement of a high school grade-point average of 2.75 or better at graduation, *and* eligibility for enrollment in Mathematics 15, Single Variable Calculus, as determined by the standard WVU Mathematics Placement Examination.

Out-of-State Residents: Achievement of a Standard ACT Mathematics score of 26 or better *or* achievement of a high school grade-point average of 3.0 or better at graduation, *and* eligibility for enrollment in Mathematics 15, Single Variable Calculus, as determined by the standard WVU Mathematics Examination.

First-year students who satisfy the ACT Mathematics or high school grade-point average requirements, but are not eligible for enrollment in Mathematics 15, may enroll in the General Studies program of the College of Arts and Sciences and attempt to gain admission to the College of Mineral and Energy Resources as transfer students, as noted below.

Transfer Students

Students desiring to transfer into the Mining and Mineral Processing Engineering programs in the College of Mineral and Energy Resources from another WVU college or school, including the General Studies program of the College of Arts and Sciences, or an outside college or university, must satisfy both the WVU general admission requirements and as a *minimum:*

1. Have a grade-point average of 2.75 or higher for all college-level work attempted.
2. Have completed Mathematics 15 and 16 and Chemistry 15 and 16 *or* Physics 11 and 12 (or their equivalent) with an average of 2.5 or better in each of the mathematics and chemistry *or* physics areas.

Petroleum and Natural Gas Engineering

First-Year Students

All applicants must take the Standard ACT test and submit official copies of ACT test scores to the Office of Admissions and Records before an admission decision will be made. (See page 13 concerning SAT scores.) An automatic admission to the College of Mineral and Energy Resources will be based on the following:

West Virginia Residents: Achievement of a Standard ACT Mathematics score of 24 or better *or* achievement of a high school grade-point average of 3.0 or better at graduation, *and* eligibility for enrollment in Mathematics 15, Single Variable Calculus, as determined by the standard WVU Mathematics Placement Examination.

Out-of-State Residents: Achievement of a Standard ACT Mathematics score of 28 or better *or* achievement of a high school grade-point average of 3.4 or better at graduation, *and* eligibility for enrollment in Mathematics 15, Single Variable Calculus, as determined by the Standard WVU Mathematics Placement Examination.

First-year students who satisfy the ACT Mathematics or high school grade-point average requirements, but are not eligible for enrollment in Mathematics 15, may enroll in the General Studies program of the College of Arts and Sciences and attempt to gain admission to the College of Mineral and Energy Resources as transfer students, as noted below.

Transfer Students

Students desiring to transfer into the Petroleum and Natural Gas Engineering program in the College of Mineral and Energy Resources from another WVU college or school, including the General Studies program of the College of Arts and Sciences, or an outside college or university, must satisfy both the WVU general admission requirements and as a *minimum:*

1. Have a grade-point average of 3.0 or higher for all college-level work attempted.
2. Have completed Mathematics 15 and 16 and Chemistry 15 and 16 *or* Physics 11 and 12 (or their equivalent) with an average of 2.5 or better in each of the mathematics and chemistry *or* physics areas.

All Students

1. A student will not be permitted to register for a Petroleum and Natural Gas Engineering course, except Petroleum Engineering 100, until the student has successfully completed Chemistry 141 and 142.
2. A student will not be considered totally admitted to the Petroleum and Natural Gas Engineering program until the student has been accepted in at least one petroleum engineering course.

Admission Petitions

Students not meeting the minimum transfer requirements for Mining and Mineral Processing and Engineering and Petroleum and Natural Gas Engineering as described above, but who demonstrate special aptitude for engineering studies, may request to be admitted to the College of Mineral and Energy Resources by written petition to the Dean. Following receipt of the written petition, the applicant will be scheduled for a personal interview with the appropriate departmental chairperson if he/she desires.

Application Deadlines

Applicants for transfer student admission to the College of Mineral and Energy Resources must be received according to the schedule below:

Desired Date of Entry:	*Deadline Date for Receipt of Application:*
Summer Session or First Semester	Preceding March 15
Second Semester	Preceding November 1

The number of transfer students accepted into the College of Mineral and Energy Resources will be governed by the enrollment capacities of each of the three undergraduate engineering programs. First admission priority will be granted to those students currently matriculated at WVU and in pre-engineering programs at state colleges and universities within West Virginia; second priority to students enrolled in pre-engineering type programs at non-state institutions; and third priority to students in non-engineering curricula at external colleges and universities. Within the three categories cited above, preferential admission will be in the following order: West Virginia residents, non-West Virginia U.S. residents, and foreign students.

Complete information concerning WVU admission, fees and expenses, is contained in Part 2. Academic information is in Part 3.

Requirements for Degrees

To be eligible to receive a bachelor's degree, a student is required to complete satisfactorily the number of semester hours of work as specified in the curriculum of the program leading to the degree for which the student is a candidate, plus the requirements of the University Core Curriculum and English.

A student admitted to a bachelor's degree program in the College of Mineral and Energy Resources subsequent to May 15, 1984, must achieve a grade-point average of 2.25 or better and a grade of C or better in all courses completed in the student's major department (i.e., Engineering of Mines, Petroleum and Natural Gas Engineering, or Mineral Processing Engineering) in order to qualify for the bachelor's degree.

Curricula

The following engineering curricula are offered in the College of Mineral and Energy Resources:

1. A four-year curriculum leading to the degree of Bachelor of Science in Engineering of Mines.
2. A four-year curriculum leading to the degree of Bachelor of Science in Petroleum Engineering.
3. A four-year curriculum leading to the degree of Bachelor of Science in Mineral Processing Engineering.

The first two years of instruction are very similar in the programs. During this period the student is given a thorough grounding in mathematics, geology, physics, and chemistry. During the third and fourth years, the student is given instruction in the engineering sciences as well as in the professional subjects. Also, studies in the humanities are continued with the student being permitted to elect a reasonable proportion of the subjects to be studied.

The mineral and energy resources programs offer professional and general electives at both the lower- and upper-division levels to all students in the areas of mineral and energy economics, mineral resources appraisal and exploration, design of mineral process operations, and models of mineral commodity markets.

Engineering of Mines

Degree: Bachelor of Science in Engineering of Mines

Mining engineering deals with discovering, extracting, beneficiating, marketing, and utilizing mineral deposits from the earth's crust. The role of the mining engineer may be quite diversified and the field offers opportunities for specialization in a large number of technical areas. The trained professional in this field is well versed in mining and geology and also in the principles of civil, electrical, and mechanical engineering as applied to the mining industry. With the present trend toward the use of engineers in industrial management

Mining Engineering

FIRST YEAR				SECOND YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Math. 15	4	Math. 16	4	Math. 17	4	Math. 18	4
Chem. 15	4	Chem. 16	4	Phys. 11	4	Phys. 12	4
Engl. 1	3	M.A.E. 41	3	Engl. 2	3	M.A.E. 42	3
Geol. 1	3	Core elect.	3	Geol. 151	4	Core elect.	3
M. 1	3	M. 2	3	E.M. 104	3	E.M. 103	3
	17		17		18		17

Miner's Safety and Qualification Course—0 hr.

SUMMER

E.M. 102—3 hr.

THIRD YEAR				FOURTH YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
E.E. 101	3	M. 281	3	E.M. 231	3	E.M. 296	3
M.A.E. 114	3	E.M. 211	3	E.M. 295	3	E.M. 271	3
M.A.E. 43	3	E.M. 225	3	E.M. 226	3	Prof. elect.	3
I.E. 113 or		E.M. 242	3	Prof. elect.	3	Tech. elect.	3
Stat. 201	3	Core elect.	6	Core elect.	6	Core elect.	3
E.M. 206	3						
Core elect.	3						
	18		18		18		15

Total: 141 hr.

Professional Electives consist of all the non-required courses and other courses in the College that have the prior approval of the mining engineering faculty.

Technical Electives: An approved list of technical electives is available at the department office.

and administrative positions, the mining engineer's training also includes economics, business, personnel management, and the humanities.

Professional technical courses include surface and underground mining systems, engineering principles of blasting, materials handling, ventilation, roof control, rock mechanics, mining equipment, coal and mineral preparation, plant and mine design, geology, and water control. In addition, students receive a foundation in the managerial, financial, environmental, and social aspects of the operation of a mining enterprise.

In the fourth year, the student may specialize in such career areas as coal mining, ore mining, or other phases of mining engineering through the proper selection of design problems and electives. The student will be assigned an adviser who will assist in this phase of the program.

Local coal fields, mines, and preparation plants provide extensive opportunity for research, instruction, and field work in a real-work situation.

A student admitted to the program must achieve a grade-point average of 2.25 or better and a grade of C or better in all mining engineering (E.M.) courses in order to qualify for the bachelor's degree.

Petroleum and Natural Gas Engineering

Degree: Bachelor of Science in Petroleum Engineering

Petroleum and natural gas engineering is concerned with design and application aspects of the discovery, production, and transportation of oil and gas resources. Professionals in this field must have a thorough understanding of the geological principles relating to the occurrence, discovery, and production of fluid hydrocarbons. The petroleum and natural gas engineer must know and be capable of applying both conventional engineering design principles as well as those pertaining specifically to the field of petroleum and natural gas engineering. These are developed in the petroleum engineering courses in the curriculum. In addition, a strong foundation in mathematics and the sciences broadens the future engineer's professional capabilities. Because many engineers will be employed as supervisors or executives, managerial and social skills are also emphasized.

Students are offered the opportunity to enter all phases of the petroleum and natural gas industry in meaningful and important jobs, continue their education towards advanced degrees, or—in some cases—pursue a combination of professional employment and continued education.

In the senior year, electives are offered in which the student may obtain additional depth of knowledge in specific areas of petroleum and natural gas technology. Each student is individually assisted in course selection by an adviser who is a member of the Petroleum and Natural Gas Engineering faculty.

Students gain practical experience and first-hand knowledge of many aspects of petroleum and natural gas engineering through close proximity to the industry in West Virginia and surrounding states. Production sites, secondary and enhanced oil recovery projects, compressor stations, gas storage fields, and corporate offices all provide excellent opportunities for study. Additional experience is provided through modern well equipped laboratories within the department and the University. Students are urged to gain field experience through summer employment in the industry.

Petroleum and Natural Gas Engineering

FIRST YEAR				SECOND YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Chem. 15	4	Chem. 16	4	Phys. 11	4	Phys. 12	4
Math. 15	4	Math. 16	4	Math. 17	4	Math. 18	4
M. 1	3	M. 2	3	M.A.E. 41	3	M.A.E. 43	3
Geol. 1	3	Core elect.	6	Geol. 151	4	Pet.E. 215 or	
Engl. 1	3			Engl. 2	3	M.A.E. 114	3
						I.E. 113 or	
						Stat. 201	3
	17		17		18		17

THIRD YEAR				FOURTH YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Pet.E. 236	3	Pet.E. 210	4	Pet.E. 207	4	Prof. elect.	3
Chem. 141	3	Pet.E. 212	1	Pet.E. 211	3	Pet.E. 216	3
M. 281	3	Pet.E. 233	3	Pet.E. 234	3	Pet.E. 299	3
M.A.E. 42	3	Pet. E. 235	3	Pet.E. 241	3	Core elect.	9
M.A.E. 101	3	Engl. 208	3	Pet.E. 244	1		
Core elect.	3	Geol. 272	3	Core elect.	3		
		Chem. 142	1				
	18		18		17		18

Total: 140 hr.

Recommended Professional Electives: Pet.E. 208, 262. (For qualified students only: Pet.E. 224, 340.)

Mineral Processing Engineering

Degree: Bachelor of Science in Mineral Processing Engineering

Mineral Processing Engineering provides energy-related engineering education and research opportunities to prepare professionals who will design, direct, and operate the processes to produce refined products and materials from raw ores and other resources. The program is designed to graduate competent, well-trained students capable of fulfilling the current and future needs of industry and government.

Specific areas include coal cleaning and preparation, coal and coal-waste utilization, environmental problems associated with coal mining and utilization, methods available for pollution control, mineral dressing, hydrometallurgy, and resolution of future energy concerns. Common techniques such as sampling, size reduction, and fine particle separation are presented in detail and beneficiation methods—such as froth flotation, gravity concentration, etc.—are emphasized. Equipment performance and control, flow sheet design, plant design, economics, and pollution control are stressed.

Mineral processing engineering is a challenging field; graduates are much in demand. Potential employers include coal companies, the metallurgical and chemical industries, utility companies, research institutes, universities, and state or federal agencies.

Mineral Processing Engineering

FIRST YEAR

First Sem.	Hr.	Second Sem.	Hr.
Chem. 15	4	Chem. 16	4
Math. 15	4	Math. 16	4
Engl. 1	3	Engl. 2	3
Geol. 1	3	M. 2	3
M. 1	3	G.P.E. 2 (Opt.)	1
G.P.E. 1 (Opt.)	1	Spch. 11	1
		Spch. 14	2
	18		18

SECOND YEAR

First Sem.	Hr.	Second Sem.	Hr.
Math. 17	4	Math. 18	4
Phys. 11	4	Phys. 12	4
M.A.E. 41	3	M.A.E. 42	3
M.P.E. 217	3	Chem. 131	4
M.P.E. 218	4	Core elect.	3
	18		18

THIRD YEAR

First Sem.	Hr.	Second Sem.	Hr.
M. 281	3	E.E. 101	3
M.A.E. 43	3	E.E. 102 (elect.)	1
M.A.E. 101	3	M.P.E. 221	4
Chem. 141	3	M.A.E. 114	3
Chem. 142	1	Core elect.	6
Prof. elect.	3		
	16		17

FOURTH YEAR

First Sem.	Hr.	Second Sem.	Hr.
M.P.E. 219	3	M.P.E. 220	4
M.P.E. 270	3	M.P.E. 222	3
Engl. 208	3	M.P.E. 250	3
Core elect.	6	Core elect.	6
	15		16

Total: 136 hr.

Recommended Professional Electives: M. 250; M.P.E. 224; E.M. 205, 224; Ch.E. 105, 224, 231, 251, 253; plus others approved by the Department.

Courses of Instruction in Mineral and Energy Resources

Minerals (M.)

1. *Mineral Engineering Problem Solving.* I. 3 hr. Freshman orientation to the College of Mineral and Energy Resources including grade-point calculation, University registration procedures, *WVU Student Handbook*, financial aid, student chapter of AIME, academic programs in the College, library programs, mineral and energy conservation, dimensional relationships, basic dimensional analysis, basic engineering graphics, vectors, descriptive geometry, area and volume, sedimentary rocks and map interpretation, drafting and lettering. 2 hr. lec., 3 hr. lab.

2. *Mineral Engineering Problem Solving.* II. 3 hr. PR or Conc.: Math. 15. Principles of surveying and introduction to FORTRAN programming. 2 hr. lec., 3 hr. lab.

250. *Evaluation of Capital and Operating Costs.* I, II. 3 hr. PR: Math. 18 or consent. Estimating capital and operating costs of mineral industries. Evaluation of potential investments, comparisons of investment alternatives, estimation of profitability, and payout of new ventures. Special problems of investment decisions in mining, petroleum, and other facets of the mineral industries.

281. *Applied Mineral Computer Methods.* I, II. 3 hr. PR: M. 2; Math. 16. Problem solving in mineral processing, mineral resources, mining, and petroleum engineering. Emphasis on applications using various computing technologies.

Engineering of Mines (E.M.)

102. *Mine Surveying.* SI, SII. 3 hr. PR: M. 2, Math. 15. Surface and subsurface surveying, celestial observations, and related calculations together with intensive field practice in underground and surface surveying. Lectures and field work arranged.

103. *Surface Mining.* II. 3 hr. PR: Math 16, Geol. 151. Surface mining methods with emphasis on planning, production, and equipment systems.

104. *Underground Mining.* I. 3 hr. PR: Geol. 151, M. 2, Math. 16. Underground mining methods for both bedded deposits and ore bodies; consideration of factors in the design (development) phase and production (exploitation) phase of an underground mining operation; application of mining machinery.

191. *Special Topics.* I, II. 1-3 hr. PR: Junior or senior standing, consent. *(Undergraduate majors only.)* Selected fields of study in mining engineering.

204. *Mining Methods for Vein Deposits.* I. 3 hr. PR: M. 2, Geol. 151, Math. 16. Methods and systems of mining other than flat seams. Emphasis on selection of methods in relation to cohesive strength of ore bodies and their enclosing wall rocks. Mining of anthracite included.

205. *Coal Mining.* I. 3 hr. PR: Junior standing or consent. *(Not open to mining engineering students.)* Introduction to elements of coal mining.

206. *Mining Exploration.* I. 3 hr. PR: E.M. 103, 104, Phys. 12, Math. 16. All phases of mineral exploration. Geological and geophysical methods, exploration drilling, data reduction and interpretation, preliminary feasibility studies and evaluation.

207. *Longwall Mining.* II. 3 hr. PR: E.M. 104. Elements of longwall mining including panel layout and design considerations, strata mechanics, powered supports, coal cutting by shearer or plow, conveyor transportation, and face move.

211. *Ground Control.* I, II. 3 hr. PR: E.M. 103, 104, M.A.E. 41, 43, Geol. 151. Rock properties and behavior, *in situ* stress field, mine layout and geological effects; designs of entry and pillar and roof bolting, convergence of openings and surface subsidence engineering.

214. *Rock Mechanics.* II. 3 hr. PR: M.A.E. 43 or consent. Elastic and plastic properties of rock, Mohr's criteria of failure, elastic theory, stress distributions around underground openings, open pit and underground stability, rock testing techniques.

217. *Geotechnics for Mining Engineers.* I. 3 hr. PR: Geol. 1, Phys. 11, Math. 16. Characteristics of earth material, geotechnics and geology concerning mine design, mine refuse disposal, slope stability, and other earth structures. Groundwater hydrology for mining application.

224. *Special Subjects for Mining Engineering.* I, II. 1-6 hr. PR: Senior or graduate standing or consent. Special problems in mining engineering, including choices among operations research, mine systems analysis, coal and mineral preparation, and coal science and technology.

225. *Mine Equipment Design.* II. 3 hr. PR: E.E. 101, E.M. 104, Chem. 16, M.A.E. 43; junior standing. Analysis of equipment requirements for mining functions; design of specific equipment components and operations; and optimization of equipment and layout choices. Course will focus on face equipment.

226. *Mine Machinery.* I, II. 3 hr. PR: E.E. 101, E.M. 103, 104, M.A.E. 43, junior standing. Design and control of fixed and integrated excavating and bulk handling machinery. Analysis includes components, operation, production, and possible failure modes. Studied are conveyors, hoists, hydraulic transport, boring machines, longwalls, bucket wheel excavators, and dredges.

227. *Advanced Mining Equipment Applications.* II. 3 hr. PR: E.M. 225, 226. Structural, mechanical, hydraulic, and electrical characertistics of the more common items of mining equipment. Controls, electrical and hydraulic circuits, and mechanical transmissions with associated problems. Laboratory design of a control system for a mining machine.

231. *Mine Ventilation.* I, II. 3 hr. PR: E.M. 104, M.A.E. 114. Engineering principles, purposes, methods, and equipment applied to the ventilation of mines.

242. *Mine Health and Safety.* I. 3 hr. PR: E.M. 103, 104. The nature of the federal and state laws pertaining to coal mine health and safety; emphasis will be placed on achieving compliance through effective mine planning, design, and mine health and safety management.

243. *Industrial Safety Engineering.* II. 3 hr. PR: Junior standing or consent. Problems of industrial safety and accident prevention, laws pertaining to industrial safety and health, compensation plans and laws, and industrial property protection.

251. *Explosive Engineering.* I. 3 hr. PR: Chem. 16, Phys. 12, M.A.E. 42. Theory and application of explosives, composition properties and characteristics of explosives, blasting design fundamentals, legal and safety considerations.

271. *Mine Management.* I, II. 3 hr. PR: E.M. 103, 104. Economic, governmental, social, and cost and labor aspects of mining as related to the management of a mining enterprise.

276. *Mine and Mineral Reserve Valuation.* I. 3 hr. PR: Senior standing. Methods used to value mineral properties; factors affecting value of mineral properties.

286. *Fire Control Engineering.* II. 3-4 hr. PR: Senior standing. Aspects involved in the control from fire, explosion, and other related hazards. Protective considerations in building design and construction. Fire and explosive protection organization including fire detection and control. 3 lec. and/or 3 hr. lab.

287. *Applied Geophysics for Mining Engineers.* II. 3 hr. PR: E.M. 103, 104, Phys. 12, Geol. 151 or consent. Origin of the universe and the planets, heat and age of the earth. Application of the science of geophysics in the location and analysis of earthquakes and in prospecting for oil and minerals.

291. *Mine Plant Design.* I, II. 3 hr. PR: E.M. 225, 226, senior standing. Layout, analysis and detailing of the major mine installations, and support facilities. Locations include: the surface plant, shaft and slope stations, section centers. Systems dealt with are bulk handling power, ventilation, supplies, water, and personnel.

295. *Mine Systems Design.* I, II. 3 hr. PR: E.M. 103, 104, consent. Each student selects and designs a mine subsystem under specified conditions, including extraction, transportation, ventilation, roof control, exploration, plant design, surface facilities, etc. 2 hr. lec., 1 hr. lab.

296. *Mine Design.* I, II. 3 hr. PR: E.M. 206, 211, 225, 226, 231, 242, 271. Comprehensive design problem involving underground mining developments or surface plant or both, as elected by the student in consultation with instructor. Preparation of a complete report on the problem required, including drawings, specifications, and cost analysis.

311. *Advanced Ground Control—Coal Mines.* I, II. 3 hr. PR: E.M. 211 or consent. Ground and strata control for underground and surface coal mining, including slope stability and subsidence.

312. *Surface Subsidence Engineering.* II. 3 hr. PR: E.M. 211. Elements of surface subsidence engineering due to underground mining: theories of surface subsidence, characteristics and prediction of surface movements, and effects of surface movements.

316. *Advanced Rock Mechanics.* I, II. 3 hr. PR: E.M. 214 or consent. Testing techniques and interpretation, strength and fracture, classification, anisotropy, friction, jointed rock, fluid pressure, fragmentation, and excavation.

320. *Mobile Excavating and Materials Handling.* I. 3 hr. PR: Graduate standing and consent. Mobile mining equipment will be systematically analyzed as to functional, production, failure, and operational aspects. Included will be routine and innovative methods, and surface and underground applications, such as the hydraulic shovel and impactors.

321. *Integrated Excavating and Materials Handling.* II. 3 hr. PR: Graduate standing and consent. Integrated mining equipment will be systematically analyzed as to functional, production, failure, and operational aspects. Included will be routine and innovative methods, and surface and underground applications, such as the longwalls and monorails.

331. *Mine Ventilation Network Analysis.* I. 3 hr. PR: E.M. 231, M. 281, or consent. Theory and computational techniques for mine ventilation network problems with emphasis on computer-aided analysis of complex mine ventilation systems.

332. *Advanced Mine Ventilation.* II. 3 hr. PR: E.M. 231. Advanced topics in mine atmospheric control including control of methane, dust, humidity and heat. Also covers leakage characteristics, fan selection, analysis of ventilation networks, and planning of mine ventilation system.

342. *Advanced Mine Health and Safety.* I. 3 hr. E.M. 242 or graduate standing. Special emphasis will be placed on mine rescue, mine disaster prevention and organization, and mine property and equipment loss prevention.

351. *Explosive Engineering Design.* II. 3 hr. PR: E.M. 251 or consent. Rock drilling, total blast systems simulation, experimental studies in blast design, rock fracturing, chemical thermodynamics, kinetics, and reaction rates.

365. *Deterministic Methods for Mineral Engineers.* I. 3 hr. PR: Graduate standing or consent. Analysis and solution of mineral engineering problems which require use of deterministic models. Application of deterministic methods to mineral transportation, mineral resource allocation and extraction problems, and mine planning and equipment utilization problems.

366. *Stochastic Methods for Mineral Engineers.* II. 3 hr. PR: Graduate standing or consent. Application of stochastic methods to mineral engineering problems in equipment selection, renewal processes, mine ventilation, mine production, and mineral extraction.

391, 392. *Advanced Mine Design.* I, II. 1-6 hr. per sem. PR: Graduate standing or consent. Advanced detail design and layout of coal mine plant, particularly incorporating new ideas of machines and mining methods.

394. *Special Topics.* I, II, S. 1-3 hr. PR: Graduate standing or consent. Selected field of study in mining engineering.

Petroleum and Natural Gas Engineering (Pet.E.)

100. *Introduction to Petroleum Engineering.* II, S. 3 hr. PR: Sophomore standing. Introduction; origin, migration, and accumulation of petroleum; reservoir fluids properties; properties of reservoir rocks; exploration; drilling technology; reservoir engineering; well completions; production engineering; surface facilities; transportation. Open to all students.

207. *Natural Gas Engineering.* I. 4 hr. PR: Pet.E. 233, M.A.E. 101, 114, Math. 18. Natural gas properties, compression, transmission, processing, and application of reservoir engineering principles to predict the performance and design of gas, gas-condensate, and storage reservoirs. Includes a laboratory devoted to gas measurements. 3 hr. lec., 3 hr. lab.

208. *Natural Gas Production and Storage.* II. 3 hr. PR: Pet.E. 207, 234 or consent. Development of gas and gas-condensate reservoirs; design and development of gas storage fields in depleted gas, gas-condensate, oil reservoirs and aquifers; design of natural gas production and processing equipment.

210. *Drilling Engineering.* II. 4 hr. PR or Conc.: Geol. 1, Math. 18, M.A.E. 114. Rock properties, functions and design considerations of rotating system, hoisting system, and circulation system; drilling fluids calculations and selections; hydraulic programs; drilling optimization; casing and casing string design; cementing programs; and pressure control.

211. *Production Engineering.* I. 3 hr. PR: Pet.E. 210. Well completion, performance of productive formulation, drill stem tests, completion of wells, flowing wells, gas lift methods and equipment, pumping installation design, well stimulation, emulsion, treating, gathering and storage of oil and gas, field automation. 3 hr. lec.

212. *Drilling Fluids Laboratory.* I, II. 1 hr. PR or Conc.: Pet.E. 210, Chem. 141, M.A.E. 114. Topics include clay hydration, viscosity of water-based fluids, mud weight control, filtration studies, thinning agents, chemical contaminants, lime muds, polymer muds, rheological models, and liquid and solid determination.

215. *Transport Phenomena in Petroleum Engineering.* II. 3 hr. PR: M.A.E. 41. Introduction to fluid flow in pipes, two-phase flow, rotary drilling hydraulics, primary cementing jobs, flow calculations, flow measuring devices, fluid machinery, dimensional analysis, and heat transfer.

216. *Petroleum Engineering Design.* I, II. 3 hr. PR: Pet.E. 234 or consent. Comprehensive problems in design involving systems in oil and gas production, field processing, transportation, and storage. Three 3-hr. labs.

224. *Petroleum Engineering Problems.* I, II, S. 3 hr. PR: Senior standing. Investigation and detailed report on a special problem in petroleum engineering. Supervised by a member of the Petroleum Engineering faculty. A final oral examination is required.

233. *Elements of Petroleum Reservoir Engineering.* II. 3 hr. PR: Pet.E. 236. Basic properties of petroleum reservoir rocks. Fluid flow through porous materials. Evaluation of oil and gas reserves.

234. *Applied Petroleum Reservoir Engineering.* I. 3 hr. PR: Pet.E. 233 or consent. Application of reservoir engineering data to calculation of recovery potentials and to analysis, simulation and prediction of reservoir performance under a variety of production methods to effect maximum conservation.

235. *Formation Evaluation.* I, II. 3 hr. PR: Pet.E. 210 or consent. Various well logging methods and related calculations with exercises in interpretation of data from actual well logs. 3 hr. lec.

236. *Petroleum Properties and Phase Behavior.* I. 3 hr. PR or Conc.: Chem. 141. Theoretical and applied phase behavior of hydrocarbon systems and hydrocarbon fluid properties. Applications to petroleum reservoir and production engineering design. 2 hr. lec., 3 hr. lab.

241. *Oil and Gas Property Evaluation.* I. 3 hr. PR or Conc.: Pet.E. 211, 234, 235. Petroleum property evaluation. Calculation of reserves and future reservoir performance, decline curves, production and formation testing, pressure transient analysis, reservoir test limit, analysis of data, curve fitting, evaluation of processing facilities, and analysis of profitability.

244. *Petroleum Reservoir Engineering Laboratory.* I, II. 1 hr. PR or Conc.: Pet.E. 233. Laboratory evaluation of basic and special petroleum reservoir rock properties. 3-hr. lab.

262. *Introduction to Reservoir Simulation.* II. 3 hr. PR: M. 281, Pet.E. 234 or consent. Partial differential equations for fluid flow in porous media and the use of finite-difference equations in solving reservoir flow problems for various boundary conditions. Study of individual well pressures and fundamentals of history matching.

299. *Well Stimulation Design.* II. 3 hr. PR: M.A.E. 43, Pet.E. 210, 233, 235. *(Field trips required.)* Fundamentals of well stimulation, treatment design and their applications to low permeability formations.

300. *Hydrocarbon Production From Carbonate Rocks.* II. 3 hr. PR: Pet.E. 233, 235. Theory of the production of oil and gas from carbonate rocks, definition and classification of pore geometry, fluid flow characteristics, performance of carbonate rock reservoirs and simulation of these reservoirs. 3 hr. lec. *(Course will not be offered in 1986-87.)*

302. *Fluid Flow in Porous Media.* I. 3 hr. PR: Pet.E. 234, Math. 18 or consent. Theoretical and practical aspects of the physical principles of hydrodynamics in porous media.

340. *Secondary Recovery of Oil by Water Flooding.* I. 3 hr. PR: Pet.E. 233. Theory of immiscible fluid displacement mechanism, evaluation and economics of water flood projects, and oil field flooding techniques.

343. *Advanced Secondary Recovery.* II. 3 hr. PR: Pet.E. 340. Secondary recovery of oil by gas flooding, miscible fluid injection, *in situ* combustion, and heat injection.

362. *Reservoir Simulation and Modeling.* II. 3 hr. PR: Pet.E. 262 or consent. Application of finite-difference equations to multi-phase fluid flow in porous media in two or three dimensions with gravity and capillary pressure effects. Simulation of waterflood performance and enhanced recovery techniques.

384. *Pressure Transient Analysis.* II. 3 hr. PR: Pet.E. 234 or consent. Methods of analysis of pressure transient data obtained from well testing for the purpose of determining *in-situ* reservoir conditions including porosity, lateral extent, average reservoir pressure, and formation permeability.

394. *Special Topics.* I, II, S. 1-6 hr. PR: Consent. Selected fields of study in petroleum and natural gas engineering.

Mineral Processing Engineering (M.P.E.)

M.P.E. Courses of Instruction

217. *Coal Preparation.* I, II. 3 hr. PR: Math. 16, Chem. 16. Formation of coal, rank classification of coal, coal petrography, principles of preparing and beneficiating coal for market with laboratory devoted to sampling, screen analysis, float and sink separation, and use of various types of coal cleaning equipment. 2 hr. lec., 3 hr. lab.

218. *Mineral Processing.* II. 4 hr. PR: Math. 17 or consent. Application of particle characterization, particle behavior in fluids, industrial sizing, and size reduction fluid-solid separations are discussed. Introduction to froth flotation, and magnetic and electrostatic separation for the concentration of minerals is described. 3 hr. lec., 1 hr. lab.

219. *Surface and Interfaces.* I. 3 hr. PR: M.P.E. 218. Surface tension phenomena, surface thermodynamics, electrical double layer, polarized and nonpolarized electrodes, insoluble monolayers, adsorption phenomena, colloidal foams and emulsion consideration as applied to mineral surfaces.

220. *Mineral Flotation.* II. 4 hr. PR or Conc.: M.P.E. 219. The application of surface phenomena for the beneficiation of minerals, including naturally hydrophobic,

insoluble oxides, and semi-soluble and soluble minerals. Activation and depression of sulfide minerals. Engineering and design of flotation circuits. 3 hr. lec., 1 hr. lab.

221. *Hydrometallurgy.* II. 4 hr. PR: Chem. 141, 142; Conc.: M.A.E. 101. Electrochemical aspects and rates of solid-liquid reactions as applied to leaching, concentration and recovery of minerals. Solvent extraction, ion exchange, electrowinning, and other current industrial processes.

222. *Rate Phenomena in Extractive Metallurgy.* II. 3 hr. PR or Conc.: M.A.E. 114, Chem. 141, 142. Momentum heat and mass transfer phenomena theory, concepts of boundary layers and techniques of process analysis as applied to metallurgical reaction systems.

224. *Mineral Problems.* I, II. 1-6 hr. PR: Senior or graduate standing or consent. Special problems considered in minerals beneficiation and processing, including choices among design and research projects in coal preparation, coal conversion, hydro- and extractive metallurgy or mineral economies.

250. *Control Systems in Mineral Processing.* II. 3 hr. PR: Junior standing in mineral processing engineering. Instrumentation and automatic control systems used in today's mineral processing technology are studied including data recording and control and process optimization.

270. *Design and Synthesis.* I. 3 hr. PR: M.P.E. 217, 219; M. 281. The logic and quantitative tools required for synthesizing mineral processing systems are used on a realistic problem by students working independently. Specific attention given to economic and environmental implications.

M.E.R. Courses of Instruction for the M.P.E. Program

310. *Advanced Hydrometallurgy.* I. 3 hr. PR: M.P.E. 221 or consent. Advanced concepts of hydrometallurgy. Recent technology of leaching, concentration, recovery of metal and mineral values, various mechanisms of leaching of minerals. Techniques such as continuous ion exchange, thermal precipitation and current electrolytic technology.

317. *Advanced Coal Preparation.* II. 3 hr. PR: M.P.E. 217 or consent. The origin and distribution of mineral matter in coal including specific gravity distributions. Fine grinding and beneficiation by flotation technology. Coke blending, solid waste disposal, and advanced plant design.

318. *Advanced Mineral Processing.* II. 3 hr. PR: M.P.E. 219, 220, or consent. Advanced surface phenomena techniques including rigorous treatment of electrokinetic measurements and applications. Advanced concepts of collector adsorption on minerals and flotation response.

320. *Modeling of Mineral Extraction Processes.* I. 5 hr. PR: Consent. Theory of particle size distribution functions and population balance models, size reduction kinetics and interphase transfer kinetics and application to the separation of dissimilar solids by physical and chemical methods.

324. *Advanced Special Topics.* I and II. 1-6 hr. PR: Consent. Special advanced problems in mineral process engineering including choices among topics related to coal preparation, conversion, and process metallurgy.

Mineral Resource Economics (M.E.R.)

97. *Energy Resource Economics.* I, II. 3 hr. Dilemmas posed for developing and modern societies by rising energy demands amid concerns for the world's environment. Economics of fuel sources and technologies, and historical and new concerns over resource scarcities.

98. *National Energy Policy.* II. 3 hr. Resource and energy policy problems on a national level, including mineral import quotas, prorationing, federal tax and land-law policy, leasing, mineral research and education, health, and social concerns.

101. *Principles of Resource and Energy Economics.* II. 3 hr. PR: Econ. 54 or consent. Analyzes background for problems important or peculiar to mineral industry economics: exhaustion, externalities, commodity trading, conservation, and the special role of minerals in development and international trade. The analyses of monopoly regulation, antitrust action, and resource planning are presented, and projections made for energy, major metals, and industrial minerals. 3 hr. lec.

200. *Mineral Resource Conservation.* I. 3 hr. PR: Junior standing. The economics of conservation for nonrenewable resources; traditional and modern views; new environmental concerns; problems of regulation. An introduction to cost benefit analysis and to national energy and mineral policy.

245 / 345. *Energy Economics.* 3 hr. Analysis of the energy sector of the economy. Emphasis on current policy issues: OPEC, energy security, deregulation, hard vs. soft paths, impediments to coal use. (May not be taken for both undergraduate and graduate credit.)

260 / 360. *Resource Appraisal and Exploration Decisions.* 3 hr. Appraisal techniques for mineral resources including deposit, project, and regional evaluation. Exploration decisions and Bayesian analysis. (May not be taken for both undergraduate and graduate credit.)

301. *Minerals Technology Assessment.* I, II. 3 hr. PR: Consent. Introduction and review of methods applied to the systematic study of the effects on society that may occur when minerals technology is introduced, extended, or modified.

303. *Economic Analysis of Mineral Markets.* I. 3 hr. Microeconomic theory applied to mineral demand, supply, prices, trade, and industrial organization. Forecasting techniques incorporating risk and uncertainty developed to analyze mineral markets.

307. *Mineral Policy Analysis.* II. 3 hr. PR: M.E.R. 360 or 365. Economics of mineral resources and public policy decisions; problems and effects of regulation and taxation; forms of government taxation and participation; mineral rents.

309. *Quantitative Methods in Mineral Economics.* 3 hr. PR: Stat. 101 or Econ. 125. Probability and statistical techniques for mineral economics. The development and application of computer programs; mineral market models, time-series forecasting techniques, input-output analysis, geostatistical methods, project analysis. 2 hr. lec., 1 hr. lab.

331. *Minerals Technology Assessment.* II. 3 hr. Methods of studying the effects of modifications in technology on the production or utilization of minerals, and the effects on mineral demand, supply, substitutions, and markets.

341. *Economics of the Metal Industries.* II. 3 hr. Supply, demand, structure, production, technology, costs, prices, and problems of the metals industry.

342. *Economics of Industrial Mineral Industries.* I. 3 hr. Supply, demand, structure, technology, costs, prices, and problems of the industrial mineral industries.

355. *Advanced Regional Energy Economics 1.* I. 3 hr. Advanced location theory; development of regional income and product accounts. Construction of regional and interregional input-output, dynamic and other models. Application to a variety of regional and interregional energy and mineral problems.

359. *Advanced Regional Energy Economics 2.* II. 3 hr. Regional and interregional growth theory. Impacts of changing energy and resource prices on regional and interregional economic development. Regional economic development policy in the United States and selected foreign countries.

365. *Mineral Finance.* II. 3 hr. Methods, risks, and problems of financing mineral projects. Large foreign-project financing, concerns of host governments, multinational mining concerns, and financial institutions.

381. *Theory and Policy of Mineral Economics.* II. 3 hr. Defines the pure theory of resources and energy allocation with technologic, geologic, and environmental constraints. A general model is presented with partial and special applications for major problem areas: resource valuation, conservation, exhaustion, taxation, and trade. Problems of imperfect competition and monopoly open consideration to the foundations of policy in practice and theory.

394. *Special Topics in Mineral Economics.* I, II. 3 hr. PR: Consent. Selected economic problems in petroleum and natural gas engineering and the mineral industries.

398. *Models of Mineral Commodity Markets and Industries.* II. 3 hr. PR: Econ. 325, 326. Econometric studies analyzing the behavior and problems of selected mineral industries and commodities from the viewpoint of the firm, industry, and region of interest. Emphasizes econometric models, programming models, and other mineral modeling approaches.

Multidisciplinary Studies

Multidisciplinary Studies (MDS) courses are those which: (a) analyze significant issues, problems, or themes by applying two or more disciplines to them; or (b) explore the theoretical and methodological relationship of two or more disciplines to each other; and (c) involve a combination of disciplines so as to preclude their being classified realistically as one of humanities, social science, or physical science.

Responsibility for approving MDS courses rests with the Core Curriculum Committee and the Faculty Senate. Each course has its own staff, drawn from the faculties of the colleges and schools of the University.

MDS courses may be credited to University Core, as indicated.

Only one Multidisciplinary Studies course may be counted toward fulfilling Core requirements in each Core area.

Multidisciplinary Studies (MDS)

2. *Genetics, Society and Human Affairs.* II. 3 hr. *(May be credited to University Core B or C.)* Origin of life, selection, mutation, eugenics, genetic engineering, genetics and evolution, genetics and medicine, genetics and politics, decision making, social and ethical issues in human genetics. For students interested in heredity and heritage.

40. *Introduction to Women's Studies.* I, II. 3 hr. *(May be credited to University Core A or B.)* A study of the major contexts in which woman's identity has been and is defined and of the relationships between these definitions and the roles of history of women (and men) in society and culture. *(Also listed as Wm. St. 40.)*

50. *Introduction to Gerontology.* I, II. 3 hr. PR: Sophomore standing. *(May be credited to University Core B.)* Introduction to biological, psychological, and sociological processes and problems associated with human aging, with attention to selected social policies.

60. *Human Sexuality.* I, II. 3 hr. *(May be credited to University Core B or C.)* A study of the biological, behavioral, and societal aspects of sexuality. Issues considered include: changing fecundity; socio-legal implications; sex roles; veneral disease; populations; erotica; aging; dysfunctions; decision-making skills for sex-related issues.

70. *The Human Environment.* I. 3 hr. *(May be credited to University Core B or C.)* An examination of some of the facets of the environment which most directly affect human welfare. Central focus on environmental deterioration and corrective public policies. An interdisciplinary, non-prerequisite course for all students in the University.

80. *Special Topics.* I, II. 1-3 hr.

90. *Man and Food.* I, II. 3 hr. *(May be credited to University Core A or B or C.)* Exploration on a global basis of interactions of man and environment as reflected in food production systems. Relation of food supply and use to development or maintenance of social and political institutions.

91. *Introduction to Technology and Society 1.* I or II. 3 hr. *(May be credited to University Core A or B or C.)* A team-taught introduction to technology (its nature and goals) and society (its nature and goals) in the Victorian era.

92. *Introduction to Technology and Society 2.* I or II. 3 hr. PR: MDS 91. *(May be credited to University Core A or B or C.)* Continuation of MDS 91.

250. *Issues in Gerontology.* I, II. 3 hr. PR: Consent. *(May be credited to University Core B.)* Analysis of societal aspects of aging and exploration of current issues in gerontology. Relating of gerontological concepts to previous course work and field experience.

School of Nursing

Admission—Basic Program

To qualify for admission to the School of Nursing basic program a candidate must have completed one year of prescribed courses in an accredited college or university. Applicants are eligible for review by the Admissions Committee after completion of one full semester of course work in an accredited college or university. The prescribed courses include subjects such as: Chemistry, 8 hours; English Composition, 3 hours; Introductory Sociology, 3 hours; Introductory Psychology, 3 hours; Nutrition, 3 hours; Life Span Growth and Development, 3 hours; Core subjects, Biology, 4 hours, and/or electives.

A dominant factor in the number of students admitted is the limitation of space. Currently, the maximum number of basic students which can be accommodated is 72. *Since West Virginia University is a state university, and since the number of qualified applicants exceeds the number which can be accommodated, primary consideration is given to applicants from West Virginia.* However, up to 10 percent of those admitted to each class may be from out of state.

Application forms for the School of Nursing are distributed by the Office of Admissions and Records at the Medical Center after December 1. Application for admission to the School of Nursing must be made by February 15 of the year the candidate wishes to be admitted. The application may be presented in person or mailed directly to the Assistant to Director of Admissions and Records, WVU Medical Center, Morgantown, WV 26506. An application fee of $10.00, payable to West Virginia University, must accompany the completed application. The deadline for receipt of transcripts and other required materials is February 15.

The applicant's academic record is the major factor in the decision on admission. The West Virginia resident must have a grade-point average of 2.5,

or above, on all college work attempted, to qualify for consideration. Residents of other states must have an average of 3.2 or above on all college work attempted to be considered. West Virginia applicants whose grade-point average falls between 2.3 and 2.5 may petition in writing to the Admissions Committee for special consideration. Out-of-state residents with a grade-point average between 3.0 and 3.2 also may petition. Such a petition must be submitted along with the application and must clearly state why the applicant should receive special consideration.

The review of applicants takes approximately two months. The students are notified by mail after review is completed. Two weeks after receipt of the letter of acceptance, the student must send a letter stating acceptance of the position to the Assistant to Director of Admissions and Records, WVU Medical Center, Morgantown, WV 26506. A $50.00 advance deposit must accompany the letter. This deposit is applied toward the registration fees for the first semester. The deposit is nonrefundable should the student decide not to enter after formally accepting a place in the class.

Admissions—Transfer Students to Basic Programs

A student with nursing credit from an accredited college or university is eligible for admission by presenting a record of courses comparable to those required in this curriculum and meeting other School of Nursing admission requirements. Application for transfer students should be initiated three months prior to the beginning of the semester in which they wish to begin nursing courses.

Transcripts and other required materials must be received no later than two months before the start of the entering semester. Apply to: Assistant to Director of Admissions and Records, WVU Medical Center, Morgantown, WV 26506 specifying request for admission as a transfer student.

Program for Registered Nurse Students

The School of Nursing offers graduates of diploma and associate degree nursing programs the opportunity to complete requirements for the baccalaureate degree in nursing at the Morgantown campus, at the Charleston Division of the WVU Medical Center, and by extension at Shepherdstown, Parkersburg, and Beckley. General education credits earned in any accredited college or university may be applied toward the fulfillment of the degree requirements, if the course work is comparable. The continued offering of nursing courses at the various extension sites is dependent upon faculty resources and a minimum enrollment of 15 students in each nursing course.

Registered Nurse (R.N.) applicants are admitted directly to the School of Nursing. Acceptance and placement in the program is dependent upon the individual's academic record and upon the number of spaces available in the program. The license to practice nursing and a grade-point average of 2.5, or better, on all college work attempted, are required. Registered Nurses whose grade-point average falls below 2.5 may petition in writing to the Committee on Admissions for special consideration. A license to practice nursing as an R.N. in West Virginia is required for enrollment in all clinical nursing courses.

A minimum of 30 hours of general education courses that meet the WVU Core Curriculum and School of Nursing requirements should be completed before enrollment in the first nursing courses, Nursing 100, Basic Concepts in Professional Nursing and Nursing 101, Transitional Practicum. It is recom-

mended that the 30 hours be selected from the suggested freshman and sophomore courses listed in the "Suggested Plan of Progression" under the section on curriculum in the *WVU Medical Center Catalog*. Special attention should be given to the physical, biological, and psycho-social sciences. Completion of additional general education courses beyond the 30 hours is recommended if the RN student wishes to carry a part-time course load. The second semester of chemistry may be waived if the applicant has successfully completed comparable laboratory science courses and meets other science requirements (Anatomy, Physiology, Microbiology, and Pharmacology).

All R.N. students are required to enroll in Basic Concepts of Professional Nursing (Nursing 100) and concurrently in Transitional Practicum (Nursing 101). The purpose of these courses is to facilitate transition into baccalaureate nursing. Special emphasis is placed on socialization into role and expectations of this role according to the School of Nursing's conceptual framework.

Graduates of associate degree programs establish lower-division nursing credit by the transfer of hours. Graduates of diploma programs establish sophomore-level credit in nursing by successful completion of a comprehensive lower-division challenge examination.

Upon successful completion of Nursing 100 and 101, establishment of Sophomore nursing credit, and completion of the general education course requirements for the first and second years of the program, the R.N. student is eligible for the advanced placement experience (APE). This semester-long experience is a conceptual approach to the challenge of Junior nursing courses. The experience results in an individualized diagnostic analysis of learning needs and completion of prescribed learning to meet these needs. The prescriptive component of the advanced placement, usually completed during the same semester as the APE, forms the basis for continued learning in senior courses. Difficulty with APE may require special work or enrollment in sophomore or junior course work. Generally, APE is followed by enrollment in senior nursing courses.

Senior nursing courses must be taken by enrollment. Successful completion of junior level advanced placement experience and general education requirements must be met prior to enrollment.

Requests for application forms for the Morgantown campus and Parkersburg or Shepherdstown extension sites should be addressed to the Assistant to Director of Admissions and Records, WVU Medical Center, Morgantown, WV 26506.

Application forms for the Charleston Division or Beckley extension site may be obtained from the Student Affairs Coordinator, Charleston Division, WVU Medical Center, 3110 MacCorkle Ave., S.E., Charleston, WV 25304.

Further information about the program may be obtained from Chairperson, Sophomore Academic Unit, School of Nursing, WVU Medical Center, Morgantown, WV 26506; or Chairperson, Charleston Academic Unit, School of Nursing, Room 2017, WVU Medical Education Building, 3110 MacCorkle Ave., S.E., Charleston, WV 25304.

Curriculum and Courses

For complete information concerning curriculum and courses of instruction in the School of Nursing, see the *WVU Medical Center Catalog*.

School of Pharmacy

Pharmacy was first offered at West Virginia University as a department in the School of Medicine, beginning in 1914. It was changed to the College of Pharmacy in 1936 and to the School of Pharmacy in 1958.

In 1960, the School of Pharmacy changed from a four-year to a five-year program, including two years of pre-pharmacy. The pharmacy curriculum consists of three years of professional study preceded by a minimum of two years of study in an accredited college of arts and sciences.

The School of Pharmacy is accredited by the American Council on Pharmaceutical Education. The Council is composed of members from American Pharmaceutical Association, National Association of Boards of Pharmacy, American Association of Colleges of Pharmacy, and American Council on Education.

The School of Pharmacy holds membership in the American Association of Colleges of Pharmacy whose objective is to promote the interests of pharmaceutical education. All institutional members must maintain certain requirements for entrance and graduation.

Admission

All students seeking enrollment in the School of Pharmacy must comply with regulations appearing in the *WVU Undergraduate Catalog* and the *WVU Medical Center Catalog*.

Students preparing for the study of pharmacy may satisfy the course work requirements for entrance into the School of Pharmacy by majoring in any arts and sciences subject and including in their course selection the following, or their equivalents:

English Composition	6 hr.	Chemistry, General	8 hr.
College Algebra*	3 hr.	Chemistry, Organic	8 hr.
Trigonometry*	3 hr.	Physics	8 hr.
Principles of Economics	6 hr.	Electives (Core A & B)**	18 hr.
Biology, General	8 hr.		
		TOTAL	68 hr.

*Pre-calculus or calculus (4 hr.) may be substituted for these two courses.

**Electives must be designed to satisfy University Core Curriculum requirements. Electives: Core Group A—12 hr.; Core Group B—6 hr.

Because limited openings are available, preference in admissions is given to qualified West Virginians although outstanding nonresident applicants will be considered. Careful consideration is given to those personal qualifications which bear upon fitness of applicants for the study and practice of the profession.

Admissions are competitive and are based on the cumulative academic average and science average achieved in all prior college courses, a personal interview, recommendations, and the results of the Pharmacy College Admission Test (PCAT.) A required course in which a grade of D was received will usually have to be repeated with a grade of C or better before acceptance can be granted by the School of Pharmacy Committee on Admissions.

For admission to the School of Pharmacy, formal application should be made to the Committee on Admissions of the School of Pharmacy as early as possible after January 1, but by April 1, preceding the fall term (first semester) in which the student is seeking enrollment. Formal applications

received after the April 1 deadline will be considered only when vacancies exist.

Applicants should write to the Office of Admissions and Records, WVU Medical Center, Morgantown, WV 26506, which will furnish official blanks on which formal application must be made. A $10.00 application fee is required and must accompany the application.

Each applicant recommended for acceptance is expected to deposit $50.00 before the applicant's name is entered upon the official list of those accepted by the School of Pharmacy. If the applicant enrolls, this sum is applied to the first-semester tuition. If the applicant fails to enroll, this deposit is forfeited.

It is required that during the first semester of the first year all students must complete certain prescribed immunization and diagnostic procedures.

Complete information may be obtained from the Dean of the School of Pharmacy, Morgantown, WV 26506; or from the Office of Admissions and Records, WVU Medical Center, Morgantown, WV 26506.

Pharmacy College Admission Test

Completion of the Pharmacy College Admission Test is a requirement for admission. It is strongly recommended that the student take the test in the fall before making application for admission. Information concerning time and place of the test can be obtained from a pre-pharmacy adviser, the School of Pharmacy, or by writing: Pharmacy College Admission Test, The Psychological Corporation, 7800 Old Oak Blvd., Cleveland, OH 44130.

Personal Interview

A personal interview with the Committee on Admissions is required. Interviews are held at the WVU Medical Center and are arranged insofar as possible to suit the convenience of the applicant. Interviews are scheduled during February, March, and April. Only applicants with a cumulative and science grade-point average of 2.5 or above will be called for an interview, unless openings are available.

Admission to Advanced Standing

If space is available, students from other accredited schools of pharmacy may be admitted, provided they meet the course requirements of the WVU School of Pharmacy, have a 2.5 grade-point average, and are eligible for readmission for the degree in pharmacy in the school previously attended. D grades in professional courses will not be transferred.

Curriculum and Courses

For complete information concerning the curriculum and courses of instruction in the School of Pharmacy, see the *WVU Medical Center Catalog*.

School of Physical Education

J. William Douglas, Ph.D., *Dean of School of Physical Education; Professor.*
William L. Alsop, Ed.D., *Chairperson, Department of Sport and Exercise Studies; Associate Professor.*
Carl P. Bahneman, Ph.D. *Chairperson, Department of Professional Physical Education; Professor.*
Daniel E. Della-Giustina, Ph.D., *Chairperson, Department of Safety Studies; Professor.*
Patricia K. Fehl, Ed.D., *Chairperson, Department of General Physical Education; Professor.*

The School of Physical Education is organized into four departments: (1) Department of Professional Physical Education; (2) Department of Sport and Exercise Studies; (3) Department of Safety Studies; and (4) Department of General Physical Education.

Professional students (physical education teaching majors or sport and exercise studies majors) examine the relationship of play, games, sport, athletics, and dance to our culture and cultures throughout the world. Their preparation includes the acquisition of knowledge and skills from a vast array of movement activities in addition to an understanding of associated physiological, biomechanical, sociological, psychological, historical, philosophical, and pedogogical principles. Students in safety develop competencies which enable them to use innovative approaches in the conduct of safety and driver instructional activities. Their preparation is designed to develop foundation skills and knowledge related to accident prevention.

Graduates (Professional Physical Education) with teaching and/or athletic training coaching certification are generally employed as elementary or secondary physical education teachers and athletic coaches/trainers. Graduates (Sport and Exercise Studies) complete nonteaching curricula and are employed at such community agencies as YMCAs and YWCAs, private sport enterprises, health spas, fitness centers, community or industrial recreation projects, private and public camps, sporting goods stores, commercial sporting goods manufacturers, professional and collegiate athletic promotion and administration; others are employed as sport writers or sport broadcasters. Graduates (Safety Studies) with teacher certification are generally employed as driver and traffic and emergency care teachers, and others are employed as safety specialists in business and industry.

Programs

Baccalaureate degree programs offered in the School of Physical Education are: (1) teacher certification in the Professional Physical Education program and (2) Sport and Exercise Studies programs with a chosen emphasis from sport management, sport marketing, sport writing, sport broadcasting, sport physiology, and sport behavior (psychology/sociology). Certification is available in: (1) athletic training; (2) athletic coaching; (3) dance; and (4) safety education.

Degrees at both the masters and doctoral levels are offered in Professional Physical Education, Sport and Exercise Studies, and Safety Studies. For more information about these degrees and programs, consult the *WVU Graduate Catalog.*

Facilities

Facilities of the School of Physical Education include the gymnasium, dance studio, and swimming pool in Moore Hall; gymnasiums in Stansbury Hall; bowling lanes and game rooms in Mountainlair; indoor track, tennis courts, weight training room, and rifle range in the Shell Building; outdoor areas including the stadium, tennis courts, archery range, soccer and field hockey fields, outdoor track; and the Natatorium.

The Coliseum contains the Ray O. Duncan Memorial Library, classrooms and seminar rooms, a large gymnasium, a dance studio, handball and squash courts, safety studies laboratories, human factors research laboratories, and faculty offices. Additional faculty and staff offices are in Moore Hall, Stansbury Hall, the Natatorium, and the Shell Building.

Faculty

William L. Alsop, Ed.D. (WVU), *Associate Professor of Physical Education.*
Carl P. Bahneman, Ph.D. (U. Pitt), *Professor of Physical Education.*
Brenda Benjamin, B.S. (WVU), *Lecturer in Physical Education; Athletic Trainer.*
Kittie J. Blakemore, M.S. (WVU), *Associate Professor of Physical Education; Basketball Coach.*
William A. Bonsall, M.S. (WVU), *Associate Professor Emeritus of Physical Education.*
Cindy Booth, M.S. (U. Kans.), *Instructor in Physical Education; Athletic Trainer.*
Kristen Brandt, B.A. (Pt. Park C.), *Lecturer in Physical Education.*
Dana D. Brooks, Ed.D. (WVU), *Associate Professor of Physical Education.*
Linda K. Burdette, M.S. (WVU), *Assistant Professor of Physical Education; Gymnastics Coach.*
Wincie Ann Carruth, Ph.D. (NYU), *Professor Emerita of Physical Education.*
Linda M. Carson, Ed.D. (WVU), *Assistant Professor of Physical Education.*
W. Gale Catlett, B.S. (WVU), *Lecturer in Physical Education; Head Basketball Coach.*
Ray Cool, M.S. (WVU), *Lecturer in Physical Education.*
E. Eugene Corum, M.S. (WVU), *Associate Professor Emeritus of Physical Education.*
Daniel E. Della-Giustina, Ph.D. (Mich. St. U.), *Professor.*
J. William Douglas, Ph.D. (Ohio St. U.), *Dean and Professor of Physical Education.*
Pamela Duthie, Ph.D. (Wash. St. U.), *Assistant Professor of Physical Education.*
Edward F. Etzel, Jr., M.S. (WVU), *Lecturer in Physical Education; Rifle Coach.*
Patricia K. Fehl, Ed.D. (Ind. U.), *Professor of Physical Education.*
William A. Fiske, M.S. (Biscayne C.), *Lecturer in Physical Education; Assistant Basketball Coach.*
Kevin H. Gilson, Ed.D. (WVU), *Associate Professor of Physical Education; Swimming Coach.*
Stephen Harrick, M.A. (WVU), *Associate Professor Emeritus of Physical Education.*
Andrew H. Hawkins, Ph.D. (Ohio St. U.), *Assistant Professor of Physical Education.*
Beatrice Hurst, M.A. (Columbia U.), *Associate Professor Emerita of Physical Education.*
Kim Kemp, M.S. (U. Wyo.), *Lecturer in Physical Education; Track and Field and Cross Country Coach.*
Robert L. Kurucz, Ph.D. (Ohio St. U.), *Professor of Physical Education.*
John C. McGrath, M.S. (Bemidji St. C.), *Assistant Professor of Physical Education; Soccer Coach.*
Gary D. McPherson, M.Ed. (WVU), *Lecturer in Physical Education; Associate Basketball Coach.*
Kenard McPherson, Ed.D. (Mich. St. U.), *Associate Professor of Safety Studies.*
C. Everett Marcum, H.S.D. (Ind. U.), *Professor of Safety Studies.*
Randall Meador, M.S. (WVU), *Lecturer in Physical Education; Athletic Trainer.*
George A. Nedeff, M.S. (WVU), *Adjunct Assistant Professor of Physical Education.*
Don Nehlen, M.S. (Kent St. U.), *Lecturer in Physical Education; Head Football Coach.*
Andrew C. Ostrow, Ph.D. (U. Calif.), *Professor of Physical Education.*

Gregory A. Ott, M.S. (U. Ariz.), *Instructor in Physical Education; Athletic Trainer.*
Mary Jane Pearse, M.S. (WVU), *Associate Professor Emerita of Physical Education.*
Lynda Plavin, M.S. (Stanford U.), *Instructor in Physical Education.*
Martin H. Pushkin, Ed.D. (WVU), *Lecturer in Physical Education, Track and Field and Cross Country Coach.*
I. Dale Ramsburg, Ed.D. (WVU), *Assistant Professor of Physical Education; Baseball Coach.*
Fred A. Schaus, M.S. (WVU), *Adjunct Associate Professor of Physical Education; Director of Intercollegiate Athletics.*
John Semon, M.S. (WVU), *Associate Professor Emeritus of Physical Education.*
Pete Shaffron, Jr., Ed.D. (WVU), *Assistant Professor of Safety Studies.*
Andrew J. Sorine, Ed.D. (WVU), *Assistant Professor of Safety Studies.*
John C. Spiker, M.Ed. (U. Pitt), *Adjunct Associate Professor of Physical Education; Athletic Trainer.*
Susan Strand, M.S. (St. Cloud U.), *Lecturer in Physical Education.*
David H. Taylor, M.S. (WVU), *Instructor in Physical Education; Director, Recreation-Intramurals.*
Martha T. Thorn, M.S. (WVU), *Lecturer in Physical Education; Tennis Coach.*
Patrick A. Tork, M.S. (WVU), *Professor Emeritus of Physical Education.*
Craig C. Turnbull, M.S. (WVU), *Lecturer in Physical Education; Wrestling Coach.*
Charity W. White, M.S. (WVU), *Associate Professor Emerita of Physical Education.*
Mary Kathryne Wiedebusch, M.A. (WVU), *Associate Professor of Physical Education.*
Robert L. Wiegand, Ed.D. (U. Ga.), *Professor of Physical Education.*
Bruce W. Wilmoth, M.S. (B. Young U.), *Associate Professor of Physical Education.*
Rachel A. Yeater, Ph.D. (WVU), *Associate Professor of Physical Education.*
C. Peter Yost, Ph.D. (U. Pitt), *Professor and Dean Emeritus of Physical Education.*
Daniel H. Ziatz, Ph.D. (U. Utah), *Associate Professor of Physical Education.*

Admission

For admission to the School of Physical Education, prospective students must be qualified for admission to WVU and have a grade-point average of 2.0.

Students will be considered for admission to WVU on the basis of graduation and submission of transcripts from accredited high schools. High school graduates are required to present credit for 4 units of English, 1 unit of biology, 3 units of social studies, 2 units of college preparatory mathematics, 1 of which must be algebra, and 8 units of electives.

All students are required to take the American College Testing Program (ACT) tests or the Scholastic Aptitude Test (SAT) and have the report of scores sent to WVU prior to the admission decision. Students admitted on the basis of SAT scores must submit results of the ACT by the end of the first semester of their freshman year.

Students from West Virginia high schools should obtain applications for admission from their high schools. Out-of-state students may write the WVU Office of Admissions and Records and request an application form. Applicants should prepare their part of the application and return it to their secondary school. The school will send the completed application and a transcript of high school grades directly to the WVU Office of Admissions and Records, P.O. Box 6009, Morgantown, WV 26506-6009.

Students interested in financial assistance must file a Financial Aid Form. Forms are available at the high schools or from the Student Financial Aid Office, P.O. Box 6004, Morgantown, WV 26506-6004. Submit forms dated only for the current academic year.

Credit Load Per Semester

The minimum work per semester is 12 hours and the maximum work per semester is 20 hours. Exceptions to this regulation are:

An adviser may register a student as a part-time student if less than 12 hours are required to meet all requirements for the bachelor's degree.

Other exceptions to these regulations may be requested by petitioning the Committee on Academic Standards.

Requirements for Degrees

1. *University Core Curriculum*—Students in teacher certification programs must complete general studies requirements as listed in the College of Human Resources and Education (Programs for Secondary School Teachers); other students will complete the University Core Curriculum.
2. *Teacher Certification Curriculum*—Students in teacher certification programs must complete a group of educationally related courses, as well as another subject specialization.
3. *Major Requirements*—Students must complete the requirements as determined by the appropriate department.
4. *Total Hours*—Students must complete a minimum of 128 hours.
5. *Grade-Point Average*—A minimum grade-point average of 2.0 is required for graduation.

Department of Professional Physical Education

The Department of Professional Physical Education offers opportunities for students to pursue certification in teaching, athletic training, coaching, and dance. Study by students in these areas centers on the motor development process.

Teacher Certification Program in Physical Education

The required courses for teacher certification in physical education are:

1. Theory and Foundations—P.P.E. 67, 75, 121, 126 (K-12 only), 133, 176, and S.E.S. 71 or 72, 164, 165.
2. Psychomotor
   a. Team and Individual Sports—Students must complete four of the following for K-12. Complete five of the following if Grades 5-12.
      P.P.E. 45—Football, Baseball, Softball
      P.P.E. 46—Volleyball, Soccer, Speedball
      P.P.E. 47—Basketball, Field Hockey, Team Handball
      P.P.E. 48—Tennis, Badminton, Golf
      P.P.E. 49—Archery, Bowling, Fencing
      P.P.E. 50—Wrestling, Weight Training, Track and Field
   b. Aquatics—Students must complete one of the following:
      P.P.E. 57—Aquatics
      P.P.E. 59—Synchronized Swimming
      P.P.E. 124—Water Safety Instructorship
   c. Dance—Students must complete one of the following:
      Dance 35—Theory and Practice of Modern Dance Techniques
      Dance 37—Advanced Dance Techniques with Principles of Choreography
      Dance 38—Dance Composition
      Dance 39—Folk and Ballroom Dance

d. Gymnastics—Students must complete one of the following:
P.P.E. 65—Gymnastics
P.P.E. 66—Advanced Gymnastics
e. Rhythms and Low Organization Games
P.P.E. 109—Early Childhood Activities (K-12 only)
P.P.E. 110—Middle Childhood Activities

3. Second Teaching Field and Professional Education—*(See requirements as listed by the College of Human Resources and Education.)*

Recommendation for Teacher Certification

The prospective teacher who intends to apply for teacher certification in West Virginia must satisfy the requirements: (1) in physical education and professional education; (2) in athletic training, first teaching field, and professional education; and (3) in safety education, first teaching field, and professional education.

Teacher certification in physical education is provided for Grades K-12 or 5-12. Second teaching fields may be chosen from the many and varied teaching specialization programs for elementary and secondary school teachers listed in the College of Human Resources and Education, program area in Curriculum and Instruction.

Certification in Athletic Training

The required courses for certification in athletic training are:

1. Physical Education—P.P.E. 121, 176, 219, 220, 221, 222, 223, and 324 and S.E.S. 164, 165.
2. Safety Studies—Saf. S. 70.
3. Biology—Biol. 166 or Physi. 141 or 241.

In addition, the student will complete a first teaching field and professional education requirements. *(See requirements as listed by the College of Human Resources and Education.)*

Certification in Athletic Coaching

The required courses for a WVU athletic coaching certificate are P.P.E. 121, 156, 157, and S.E.S. 72, 164, 165.

This certification program is *not* part of the subject-matter specializations approved by the West Virginia Board of Education.

Certification in Dance

The required courses for a WVU dance certification are Dance 35, 37, 38, 70, 82, 87, and 4 hours of approved electives, excluding Dance 198.

This program is *not* part of the subject-matter specializations approved by the West Virginia Board of Education.

Interdisciplinary Degree in Dance and Liberal Studies

In conjunction with the College of Arts and Sciences, the Dance Department offers a dual major requiring 42 hours in dance and 30 hours in one of the liberal arts. Students should contact one of the dance instructors for advising purposes. (See Interdepartmental Majors information in the College of Arts and Sciences section of the *Undergraduate Catalog.*)

Department of Sport and Exercise Studies

The Department of Sport and Exercise Studies offers opportunities for students to pursue degree programs in Sport Behavior, Sport Management, Sport Broadcasting, Sport Reporting, and Sport Physiology. (The degree programs in Sport and Exercise Studies are nonteacher certification programs.)

The required courses for the Sport and Exercise Studies programs are:

1. Completion of University Core Curriculum.
2. Theory and Foundation:
   S.E.S. 67, 71, 72, 164, 165, 197, 198.
   P.P.E. 75, 121, 156, 157.
3. Psychomotor Activities
   a. Team and Individual Sports—students must complete two of the following (one individual and one team).
      P.P.E. 45—Football, Baseball, Softball
      P.P.E. 46—Volleyball, Soccer, Speedball
      P.P.E. 47—Basketball, Field Hockey, Team Handball
      P.P.E. 48—Tennis, Badminton, Golf
      P.P.E. 49—Archery, Bowling, Fencing
      P.P.E. 50—Wrestling, Weight Training, Track and Field
   b. Aquatics—Students must complete one of the following:
      P.P.E. 57—Aquatics
      P.P.E. 59—Synchronized Swimming
      P.P.E. 124—Water Safety Instructorship
   c. Gymnastics—Students must complete one of the following:
      P.P.E. 65—Gymnastics
      P.P.E. 66—Advanced Gymnastics
4. Second Field—A second field is to be selected from one of the following areas. Course requirements for each area are listed:
   a. Sport Behavior (Psychology and Sociology)—Psych. 1, 2, 141, 151, 6 hours electives—200 level courses. Sociology/Anthropology 1, 5, 102, 122, 6 hours electives—100-level courses.
   b. Sport Management—Acctg. 51 and 52, Econ. 54 and 55, B. Law 111, Manag. 105. Electives—12 hours chosen from journalism, computer science, and mathematics.
   c. Sport Broadcasting—Journ. 15, 18, 19, 185, 189, 228, 284, 285, 287.
   d. Sport Reporting (Newspaper)—Journ. 15, 18, 19, 111, 118, 120, 220, 228, 241.
   e. Sport Physiology—Biol. 1 and 3, 2 and 4, Chem. 15, 16, Math. 3, 4, Phys. 1, 2, Physi. 141, 241, P.P.E. 219.

Department of General Physical Education

General Physical Education classes are open to all students of the University. A wide variety of sport, aquatic, dance, gymnastic, fitness, martial arts, outdoor adventure and lifetime sport activities are offered. The aims of the General Physical Education Program are to develop: (1) an appreciation of the body and its capacity to move; (2) movement skills of games, sport, dance, and aquatics; (3) an appreciation of the value of continued activity throughout all age periods in an individual's life; (4) an understanding of the cultural significance of sport and dance; and (5) concepts of the physiological characteristics of sport and movement.

Courses numbered G.P.E. 1-42 or Dance 4-20 are those available for election by students. Elementary education majors must enroll in G.P.E. 41 and 42. All courses are at a beginning level unless otherwise specified. Repeating an activity is not allowed except at a more advanced level.

Department of Safety Studies

Teacher Certification in Safety Education

The required courses for teacher certification in Safety Education are: Saf. S. 70, 131, 151, 232, 254, 256.

In addition, the student will complete a first teaching field and professional education requirements. *(See requirements as listed by the College of Human Resources and Education.)*

Courses of Instruction

Dance (Dance)

Lower Division

4. *Beginning Ballet.* I, II, S. 1 hr. Simple ballet techniques, positions, basic barre work, and movements of dancing.

5. *Ballroom Dance.* I, II. 1 hr.

6. *Elementary Jazz Dance.* I, II, S. 1 hr. Expressions of feelings through body movement to the jazz dance rhythms.

7. *Intermediate Jazz Dance.* I, II. 1 hr. PR: Dance 6 or consent. Further development of jazz technique and appreciation of jazz as an American art form.

9. *Ballet 2.* I, II. 1 hr. PR: Dance 4 or equiv. Ballet vocabulary with emphasis on barre work and adagio and allegro technique.

11. *Folk Dance.* I, II. 1 hr.

12. *Tap Dance 1.* I, II, S. 1 hr. Introduction to tap dance technique, including study of basic tap vocabulary, fundamental rhythms, locomotor movements and tap styles.

13. *Tap Dance 2.* I, II, S. 1 hr. PR: Dance 12. Expansion and development of the basic tap technique and vocabulary introduced in Dance 12. Introduction to Irishes, riffs, pull-backs, waltz tap, basic traveling steps, and standard audition material.

14. *Tap Dance 3.* I, II, S. 1 hr. PR: Dance 13. Intermediate-level tap technique. Course includes the study of wings, cramp-rolls, advanced riffs, time steps, breaks, turns, and soft-shoe dancing.

15. *Tap Dance 4.* I, II, S. 1 hr. PR: Dance 14. Advanced-level tap technique. Course is designed to develop speed, control, precise articulation, rhythmic accuracy, and effective dynamics. Elements of tap style, line, and performance will be studied.

17. *Elementary Modern Dance.* I, II. 1 hr.

19. *Intermediate Modern Dance.* I, II, S. 1 hr. PR: Dance 17 or 35 or consent. An extended study of modern techniques in dance developing form, control, and style.

20. *Advanced Modern Dance.* I, II. 1 hr. PR: Consent.

35. *Theory and Practice of Modern Dance Techniques.* I, II. 2 hr. Modern dance techniques and rhythmic analysis of movement patterns.

37. *Advanced Dance Techniques with Principles of Choreography.* II. 2 hr. PR: Dance 35. Concentrated study in creative movement problems.

38. *Dance Composition.* II. 2 hr. PR: Dance 35, 37. Problems in force, time, and space as elements of expressive movement.

39. *Folk and Ballroom Dance.* I, II. 2 hr. Folk, square, and ballroom dance forms.

70. *Elementary Ballet.* I. 2 hr. PR: Dance 4 or consent. Technique of classical theatrical dancing. Includes barre exercises, port de bras, basic adage movements, and center practice in jumping and beginning turns. A thorough theoretical knowledge, as well as technical achievement, is stressed.

71. *Intermediate Ballet.* II. 2 hr. PR: Dance 70 or consent. Technique of classical theatrical dancing. Includes barre exercises, port de bras, adage combinations and center practice in jumping, pirouettes, turns and basic pointe work. Emphasis on correct technical execution, purity of line, and classical style.

73. *Advanced Ballet.* I. 2 hr. PR: Dance 70, 71 or consent. Technique of classical theatrical dancing. Includes barre exercises, port de bras, adage, allegro, tours, and pointe work in complex and varied movement combinations. Theoretical knowledge and teaching fundamentals will also be developed.

75. *Ballet Repertoire.* II. 2 hr. PR: Dance 70, 71, 73 or consent. Study of the standard corps de ballet and solo variations from the classics of the nineteenth and twentieth century ballet repertoire. Also includes contemporary choreography, pointe work, and elementary partnering techniques.

82. *Jazz 1.* I, II. 2 hr. Basic jazz dance fundamentals and techniques; development of coordination, strength, and flexibility through the execution of the elementary jazz warm-ups, movement progressions, and combinations.

83. *Jazz 2.* II. 2 hr. PR: Dance 82 or consent. Continuation of jazz dance techniques and concepts with an emphasis on jazz isolations, polyrhythms, and syncopated movement sequences; continued persistence in the development of the body as an instrument of expression.

85. *Jazz 3.* I. 2 hr. PR: Dance 83 or consent. In-depth exploration of both traditional and contemporary jazz techniques and styles; continues progression towards a more advanced level of technical skill as developed and utilized through this specific dance expression.

87. *Advanced Folk Dance.* II. 2 hr. PR: Dance 39 or equiv. Advanced study of international folk dance. Includes its place in education and as a performing art and an analysis of the cultural and social backgrounds and their effect of international dance.

88. *Intermediate Modern Technique.* I, II. 2 hr. PR: Dance 17, 18, or combination of Dance 35, 37, 38 or consent. Intensive concentration of technique form, interpretation and artistic sensitivity of performance with kinesthetic awareness.

90. *Advanced Modern Technique and Repertoire.* I. 2 hr. PR: A combination of Dance 35, 37, 38 and 88 or consent. Advanced tutorial technique courses relating advanced theories and individual study in the design of technique, style and compositional form. The study incorporates the allied areas of music, art, and spoken word as stimulating effects.

Upper Division

102. *Dance Production 1.* I. 2 hr. Lecture and laboratory theories of dance production with creative projects and/or performance in the production of dance. Choreography concepts visualized and developed in the theatricality of composition, costume design, and stage design will be included.

103. *Dance Production 2.* II. 2 hr. PR: Dance 102. An in-depth concentration of dance production as an art form. Choreography concepts fully developed for performance with staging techniques, utilizing the dimensional elements of this space-time-art.

171. *Basic Rhythms and Dance Accompaniment.* II. 2 hr. PR: One semester of modern dance. Basic principles of rhythm as they relate to body movement. *(Ability to play the piano is not required.)*

198. *Special Topics.* I, II, S. 1-3 hr. PR: Consent of department chairperson. Designed to permit in-depth study of theatrical dance forms and production through an innovative course(s) or research or field experiences not included in the mjaor curriculum but as an adjunct to the curriculum.

201. *Rhythms and Dance.* I. 3 hr. An exploration of dance technique in its relation to composition and principles of choreography; developing an aesthetic and critical awareness of these principles as they are displayed in dance works.

202. *Modern Dance Techniques and Composition.* II. 3 hr. PR: Dance 35 or 37 or consent. Scientific principles of movement; basic principles of music as related to dance movement; choreographic principles; practicum in dance movement. Principles for teaching dance and problems involved in planning programs.

203. *American Folk Dance.* I. 3 hr. PR: Dance 39 or consent. American square, contra, circle, and round dance, and their relationships in the arts and aspects of American culture.

204. *History and Philosophy of Dance.* II. 3 hr. Cultural survey of dance as an expression of the society it represents; philosophy of dance; relation of dance to other art forms; dance as an educational experience.

210. *Theatre Dance 1.* I. 2 hr. PR: Dance 9. Develops a basic practical knowledge of choreographed movement in the musical theatre dance idiom. Includes a study of fundamentals of ballet for the actor, derivative musical/rhythmic forms, and elementary Broadway dance vocabulary and styles. *(Also listed as Theat. 210.)*

211. *Theatre Dance 2.* II. 2 hr. PR: Dance 210/Theat. 210. Comprehensive study of representative musical theatre dance styles, relative to period (1900 to present) and ethnic derivation. Includes study of isolationary movement and principles of classical dance applicable to the Broadway idiom. *(Also listed as Theat. 211.)*

212. *Theatre Dance Repertory.* I. 2 hr. PR: Dance 211/Theat. 211. Develops and expands the technical and stylistic fundamentals established in the Dance 210-211/Theat. 210-211 courses, applying them to reconstruction and staging of a variety of classic dance sequences from notable Broadway musicals. *(Also listed as Theat. 212.)*

213. *Theatre Dance Performance Workshop.* II. 2 hr. PR: Dance 212/Theat. 212. Continues study of dance technique, isolationary movement and stylistic vocabularies established in previous theatre dance courses. Emphasizes development of original choreography in representative Broadway dance styles. Includes study of elements of performance in musical theatre. *(Also listed as Theat. 213.)*

General Physical Education (G.P.E.)

Lower Division

1, 2. *General Program.* I, II, S. 1 hr. Courses in the following activities are offered: Aerobic Dance; Aquatics (Beginning, Intermediate, Advanced, Advanced Lifesaving, Water Safety Instructor); Badminton; Billiards; Casting; Conditioning; Dance; Figure Improvement; Fitness; Flag Football; Frisbee; Golf; Gymnastics; Handball; Horsemanship; Ice Skating; Jogging; Martial Arts (Aikido, Karate, Kung Fu, Self Defense, Tai Chi); Paddleball; Racquetball; Riflery; Slow Pitch Softball; Snow Skiing; Soccer; Squash; Table Tennis; Tennis; Trampoline; Volleyball; and Weight Training.

7. *Archery.* I, II. 1 hr.

11. *Beginning Swimming.* I, II, S. 1 hr. Designed for those who do not swim at all or cannot swim a pool length.

12. *Intermediate Swimming.* I, II, S. 1 hr. Designed for those who have minimal skills in swimming and who wish to improve basic strokes.

16. *Advanced Lifesaving.* I, II, S. 1 hr. PR: Swimming skill. Knowledge and skills for aquatic emergencies. American Red Cross Certification.

17. *Diving.* I, II, S. 1 hr. Selected dives from the one-meter and three-meter boards in the five diving categories.

18. *Advanced Swimming.* I, II, S. 1 hr. A course to develop rhythm, polish, effectiveness, and endurance in the nine styles of swimming.

19. *Orientation to Scuba.* I, II, S. 1 hr. PR: Advanced swimming skill. A beginning course for those with advanced swimming skills. Includes skin diving, safety practices, physics of diving, and elementary work with self-contained, underwater breathing apparatus.

20. *Canoeing.* I, II, S. 1 hr. PR: Swimming skill. Types of canoeing strokes, life-saving techniques for recreational canoeing.

22. *Slimnastics.* I, II, S. 1 hr. Exercises, fitness, weight control, and conditioning activities.

23. *Backpacking.* I, II, S. 1 hr. Knowledge of equipment, maps and compass skills, packing techniques and safety procedures. *(Long hikes and overnight campouts are required.)*

24. *Bowling.* I, II, S. 1 hr. Knowledge and techniques of bowling. *(Not for skilled bowlers.)*

25. *Fencing.* I, II. 1 hr.

40. *Early Childhood Activities.* I, II, S. 1 hr. For classroom teachers specializing in programs for pre-school and nursery children. Emphasis on motor growth and development patterns, discrimination of basic perceptual factors, and fundamental movements.

41. *Movement Education and Rhythms.* I, II, S. 1 hr. Basic movement skills, games, and simple rhythms appropriate for young children.

42. *Elementary Sports Skills.* I, II, S. 1 hr. Basic skills and lead-up games for children.

Professional Physical Education (P.P.E.)

Lower Division

43. *Physical Education for Elementary Teachers.* I, II, S. 2 hr. PR: P.P.E. 41, 42, or consent. Philosophy, objectives, curriculum, and methods of teaching physical education activities for children.

45. *Football, Baseball, and Softball.* I, II. 2 hr. Develops cognitive, affective, and psychomotor competencies, and teaching strategies for football, baseball, and softball.

46. *Volleyball, Soccer, and Speedball.* I, II. 2 hr. Develops cognitive, affective, and psychomotor competencies, and teaching strategies for volleyball, soccer, and speedball.

47. *Basketball, Field Hockey, and Team Handball.* I, II. 2 hr. Develops cognitive, affective, and psychomotor competencies, and teaching strategies for basketball, field hockey, and team handball.

48. *Tennis, Badminton, and Golf.* I, II. 2 hr. Develops cognitive, affective, and psychomotor competencies, and teaching strategies for tennis, badminton, and golf.

49. *Archery, Bowling, and Fencing.* I, II. 2 hr. Develops cognitive, affective, and psychomotor competencies, and teaching strategies for archery, bowling, and fencing.

50. *Wrestling, Weight Training, and Track and Field.* I, II. 2 hr. Develops cognitive, affective, and psychomotor competencies, and teaching strategies for wrestling, weight training, and track and field.

57. *Aquatics.* I, II. 2 hr. PR: Intermediate swimming. Develops cognitive, affective, and psychomotor competencies, and teaching strategies for aquatics.

59. *Synchronized Swimming.* I, II. 1 hr. PR: P.P.E. 57. Develops cognitive, affective, and psychomotor competencies, and teaching strategies for synchronized swimming.

65. *Gymnastics.* I, II. 2 hr. Develops cognitive, affective, and psychomotor competencies, and teaching strategies for gymnastics.

66. *Advanced Gymnastics.* I, II. 2 hr. PR: P.P.E. 65. Develops cognitive, affective, and psychomotor competencies, and teaching strategies for advanced gymnastics.

67. *Introduction to Physical Education.* I, II, S. 3 hr. Examines the historical and philosophical bases, sport and movement principles, and the major issues and professional practices in physical education, and sport and exercise studies.

68. *Sport Officiating.* II. 2 hr. Study of officiating.

75. *Motor Learning and Development.* I, II. 2 hr. PR: Ed.P. 103 or Psych. 1 or consent. Examines the factors influencing the acquisition of motor skills and how these factors interact with the motor development process.

Upper Division

109. *Early Childhood Activities.* I, II. 2 hr. Develops cognitive, affective, and psychomotor competencies in rhythms and games for children in early childhood.

110. *Middle Childhood Activities.* I, II. 2 hr. Develops cognitive, affective, and psychomotor competencies in rhythms and games for children in middle childhood.

121. *Sport Injury Control and Management.* I, II. 3 hr. Training, conditioning, protection, and other injury prevention measures. First aid, emergency service, and care related to physical education and athletics.

124. *Water Safety Instructorships.* I, II. 2 hr. PR: Senior Lifesaving Certification. Teaching methods in swimming and water safety. Meet American Red Cross certification standards. Course completion carries eligibility for teaching swimming, lifesaving, and water safety.

126. *Implementing Physical Education Programs, K-8.* I, II. 4 hr. PR: P.P.E. 75, and 109 or 110. Emphasis on conducting physical education in grades K-6.

133. *Physical Education in Grades 7-12.* I, II. 5 hr. PR: Junior standing; four courses in activity sequence; Ed. P. 103 and 105. Emphasis on conducting physical education in grades 7-12.

156. *Principles and Problems of Coaching* I, II, S. 2 hr. PR: Junior standing or consent. Designed to acquaint students with principles and problems of interscholastic athletic coaching.

157. *Techniques of Coaching.* I, II, S. 2 hr. PR: P.P.E. 156 or consent. *(Course may be repeated.)* Designed to permit students to gain athletic coaching experience through a supervised on-site experience with a varsity athletic team. *(Laboratory work included.)*

176. *Special Physical Education.* I, II. 2 hr. PR: P.P.E. 75, 126, 133; Conc.: P.P.E. 177. Examines motor developmental characteristics of various handicapped groups and emphasizes physical education role in remediating possible developmental deficiencies.

177. *Special Physical Education Practicum.* I, II. 1 hr. PR: P.P.E. 75, 126, 133; Conc.: P.P.E. 176. *(Open to departmental majors only.)* A supervised practice teaching experience in special physical education. (1 hr. practice.)

197. *Internship.* I, II, S. 1-12 hr. PR: Senior standing or consent. A student internship in selected agencies, businesses, and schools related to sports. *(Graded Pass/Fail.)*

198. *Special Topics.* I, II, S. 1-3 hr. PR: Consent of department chairperson. In-depth analysis of physical education subject-matter areas through an innovative course or research or field experiences not included in the major curriculum but as an adjunct to the curriculum.

219. *Gross Anatomy.* II. 3 hr. PR: Consent. Designed to provide an overview of body systems and gross anatomy of the trunk and extremities.

220. *Advanced Athletic Training 1.* S. 3 hr. PR: P.P.E. 121, S.E.S. 164, 165, Saf. S. 70 or consent. Designed to provide an in-depth analysis of life-threatening situations in athletics, athletic conditioning, and general rehabilitation concepts.

221. *Advanced Athletic Training 2.* I, S. 3 hr. PR: P.P.E. 121, 219, S.E.S. 164, 165, Saf. S. 70 or consent. Designed to investigate tissue repair, physiology of hot and cold treatment, therapeutic modalities and pharmacology relevant to athletic injury management.

222. *Advanced Athletic Training 3.* II, S. 3 hr. PR: P.P.E. 219, 220, 221 or consent. Designed to provide in-depth analysis of athletic injury mechanisms; injury evaluation techniques and rehabilitation; and muscle isolation techniques.

223. *Athletic Training Practicum.* II. 3 hr. PR: Consent. Designed for the practical application of athletic training technqiues.

Safety Studies (Saf. S.)

Lower Division

70. *First Aid and Emergency Care.* I, II, S. 3 hr. Emergency aid for the sick and injured. Emergency services aimed at reducing the potential of permanent disability or threats to life, as well as pain, damage, or suffering of less serious nature.

Upper Division

131. *Accident Prevention and Control Principles.* I, II, S. 3 hr. Basic course which structures principles, concepts, and methodology of the safety movements into introductory experiences dealing with accident prevention and control efforts recommended for various social institutions and agencies.

151. *Driver and Highway Safety Fundamentals.* II, S. 3 hr. PR: Saf. S. 131 or consent. Basic course for individuals who will provide instruction for beginning drivers which emphasize essential content, methods, and desirable practices for both classroom and laboratory applications.

231. *Safety in Motor Transportation Services.* II. 3 hr. PR: Saf. S. 131 or consent. Safety elements of automotive transportation equipment. Design, operation, planning, and control plus effects of legislation. The school motor fleet is highlighted.

232. *Safety Education Principles and Content.* I. 3 hr. PR: Saf. S. 131 or consent. Study and analysis of content areas usually recommended for instructional programs within the field of safety, with emphasis on structured learning experiences.

254. *Teaching Driver and Highway Safety.* S. 3 hr. PR: Saf. S. 151 or equiv. and valid driver license. Teaching and coordinating driver and highway safety education in schools. Arranged laboratory assures practice in providing behind-the-wheel instruction to beginning drivers.

256. *Driver and Safety Instructional Innovations.* II, S. 3 hr. PR or Conc.: Saf. S. 151 and 254. Multimedia, multivehicle, simulation, and other innovations for classroom and laboratory instruction applied to driver and safety education as revealed by research and current literature.

291. *Special Topics.* I, II, S. 2-6 hr. PR: Consent. Consideration of persistent issues and changing problems in the safety field. Seminar emphasis extends considerable attention to safety interests of participating class members.

Sport and Exercise Studies (S.E.S.)

Lower Division

67. *Introduction to Sport and Exercise Studies.* I, II, S. 3 hr. Examines the historical and philosophical bases, sport and movement principles, and the major issues and professional practices in physical education, and sport and exercise studies.

71. *Sport in American Society.* I, II. 3 hr. *(May be credited to University Core B.)* Sociocultural investigation of sport in American society.

72. *Psychological Perspectives of Sport.* I, II, S. 3 hr. An examination of personality and behavioral factors as they affect participation in sport. Topics such as stress and sport, body image, aggression and the sport participant, and the licensure of sport psychologists highlight the course.

Upper Division

164. *Kinesiology.* I, II. 3 hr. PR: Junior standing. Anatomical, mechanical, and musculoskeletal study of the human body as the instrument for efficient performance of motor activities. *(Laboratory work included.)*

165. *Physiology of Motor Activities.* I, II. 3 hr. PR: Junior standing. Human functions under stress of motor activities. *(Laboratory work included.)*

197. *Internship.* I, II, S. 1-12 hr. PR: Senior standing or consent. A student internship in selected agencies, businesses, and schools related to sports. *(Graded Pass/Fail.)*

198. *Special Topics.* I, II, S. 1-3 hr. PR: Consent of department chairperson. In-depth analysis of sport and exercise studies subject-matter areas through an innovative course or research or field experiences not included in the major curriculum but as an adjunct to the curriculum.

225. *Program Planning of Recreational Sport.* I, II, S. 3 hr. PR: Consent. An in-depth study of recreational sport programs, including philosophy, objectives, program development, management concepts, and evaluation.

School of Social Work

The School of Social Work provides a comprehensive program of professional education in social work, including degree programs at the baccalaureate and master's levels, and a range of part-time and continuing education opportunities. The Bachelor of Social Work (B.S.W.) degree is offered on the University's Morgantown campus. The Master of Social Work (M.S.W.) degree is available on the Morgantown campus and at the School of Social Work's Charleston Center.

The School of Social Work has its beginnings in the early 1930s. In 1971, Social Work became an independent school. Its programs are accredited through June, 1990, by the Council on Social Work Education. Its graduates are eligible for licensure as social workers in West Virginia.

The degree programs offered by the School of Social Work allow students the opportunity to prepare for entry-level professional practice at the baccalaureate level and to specialize at the advanced (graduate) level of study. The baccalaureate program prepares social workers for generalist practice and has been a recognized national leader in the development of baccalaureate-level curriculum to support this educational goal. The graduate program offers students opportunities to specialize in the areas of Aging, Community Health and Mental Health, or Families. Both programs emphasize social work practice in rural areas and Appalachia.

Social work, one of the oldest human service professions, is based upon social and behavioral science knowledge used to understand and provide the basis for helping individuals, groups, and communities. Social work is a profession concerned with helping people accomplish life goals and realize their full potential. Four major purposes of social work are:

1. To enhance the problem-solving, coping, and development capacities of people.
2. To promote the effective and humane operation of the systems that provide people with resources and services.
3. To link people with systems that provide them with resources, services, and opportunities.
4. To develop and improve social policy.

In carrying out these purposes, social workers seek to solve problems associated with financial need, social and cultural deprivation, racial injustice, physical and mental health, disadvantaged children, troubled youth, disturbed family relationships, and aging.

Job opportunities for B.S.W. and M.S.W. graduates are expected to increase through the 1980s. One of the more recent job forecasts by the U.S. Bureau of Labor Statistics suggests that between 1980 and 1990, social work jobs should increase by 22.5 percent. Given the positive national reputation of the baccalaureate and graduate programs, graduates often find themselves actively sought by employers.

Faculty

Professors

Sung Lai Boo, Ph.D. (Fla. St. U.)—*Assistant Dean.* Social policy, Cross-cultural practice, Social work education.

Marjorie H. Buckholz, Ph.D. (NYU)—*Emerita.*

Leon F. Ginsberg, Ph.D. (U. Okla.)—*On Leave of Absence.*

Nancy L. Lohmann, Ph.D. (Brandeis U.)—*Dean.* Social gerontology, Research measurement.

Roger A. Lohmann, Ph.D. (Brandeis U.). Nonprofit management, Social gerontology, Rural social services.
John J. Miller, Ed.D. (WVU). Research methods, Group theory and practice.
Robert A. Porter, Ph.D. (Brandeis U.). Ecology, Community development, Ethnography.
Victor L. Schneider, Ph.D. (U. Mich.)—*Emeritus.*
LeRoy G. Schultz, M.S.W. (Wash. U.). Victimology, Forensic social work.

Associate Professors

Patty A. Gibbs, Ed.D. (WVU). Death and dying, Women's issues.
Creasie Finney Hairston, Ph.D. (Case West. Res. U.)—*Coordinator of Charleston Center.* Corrections, Public and nonprofit management, Black families.
John F. Isaacson, M.S.W. (U. Penn). Family life theory, Homosexuality.
Caroline T. Mudd, M.S.W. (U. Penn)—*Emerita.*
Harold R. White, M.S.S. (SUNY—Buffalo)—*Coordinator of Field Instruction.* Field instruction, Practice in health settings.

Assistant Professors

Ernest J. Barbeau, M.S.W. (U. Pitt). Social gerontology, Ethics.
Jennifer J. Bragg, M.S.W. (WVU)—*Clinical.* Social group work, Substance abuse, Direct practice.
Pearl B. Cohen, Ph.D. (U. Pitt). Program planning and evaluation, Research methods, Mental health.
Barry L. Locke, M.S.W. (Va. Cweath. U.)—*Coordinator of Undergraduate Program.* B.S.W. curriculum, Social work in rural areas and small towns, Program planning.
Karen Northcraft, M.S.W. (WVU)—*Clinical.* Direct practice, Families, children and youth.
John A. Peters, M.S.W. (WVU). Locality development, Community mental health, Practice in rural areas.
Carol T. Tully, Ph.D. (Va. Cwealth. U.). Social gerontology, Social policy, Women's issues.

Instructors

Ronald W. Bailey, M.S.W. (WVU)—*Adjunct.* Field instruction.
Barbara DeHaas Bocchini, M.S.W. (WVU)—*Adjunct.* Field instruction.
John P. Claude, M.S.W. (WVU)—*Adjunct.* Field instruction.
Janice W. Cone, M.S.W. (Denver U.)—*Adjunct.* Field instruction.
Susan M. Cyphers, M.S.W. (WVU)—*Adjunct.* Field instruction.
Jon B. Hunter, M.S.W. (U. Wisc.)—*Adjunct.* Field instruction.
Elizabeth Kent, M.S.W. (WVU)—*Adjunct.* Field instruction.
John R. Klenowski, Ed.D. (WVU)—*Adjunct.* Field instruction.
Arlen D. Miller, M.S.W. (Ohio St. U.)—*Adjunct.* Field instruction.
Robert D. Musick, M.S.W. (WVU)—*Adjunct.* Field instruction.
Phyllis J. Nash, Ed.D. (WVU)—*Adjunct.* Field instruction.
Dorothy A. Renick, M.S.W. (WVU)—*Adjunct.* Field instruction.

Undergraduate Program Objectives

The objectives of the Bachelor of Social Work (B.S.W.) program are derived from the philosophy and goals of the School of Social Work and the missions of the University, the objectives of the social work profession, and the needs of people in our society. A primary objective is to offer the opportunity to prepare the student for the beginning level of professional social work practice.

As part of the overall educational experience, the student will obtain a well rounded, liberal arts education to assist in gaining personal knowledge and growth, developing skills necessary to think and to work from an objective frame of reference, and obtaining an awareness of human needs in the technologically advanced society.

In accomplishing these objectives, the student will be better prepared to take on the responsibilities necessary to be effective both as a person and a

helping professional. More specifically, the purpose of the baccalaureate social work program is described in four interrelated objectives:

1. To prepare the student to be an effective and responsible social work practitioner at the baccalaureate level of competency with leadership in relation to the demands of the social work profession.

2. To prepare the student to be a social work practitioner who can practice within the state of West Virginia and the Appalachian region.

3. To contribute to the enrichment of the general curriculum of WVU by providing opportunities for students to increase their sensitivity, knowledge, and understanding of human needs, social problems, and social welfare issues.

4. To contribute to the preparation of the student who may be appropriately interested in graduate-level education in social work within the School of Social Work, other graduate social work programs, and other graduate programs of study.

Accreditation

The undergraduate social work program is accredited by the Council on Social Work Education through June, 1990. Upon completion of the requirements for the B.S.W., students are eligible for regular membership in the National Association of Social Workers. Graduates are also eligible for licensure as social workers in West Virginia.

Admission

Initial application to WVU should be submitted to the Office of Admissions and Records and should follow the same procedure as for all other freshman students.

Freshman and sophomore students who are pre-social work majors should consult the pre-major adviser in the School of Social Work. The adviser will assist students in planning an academic program as well as provide information about careers in social work.

Application for admission to the Bachelor of Social Work (B.S.W.) program should be made early during the spring semester of the sophomore year. Admission to the B.S.W. program is competitive. Pre-majors at WVU or Potomac State College are not automatically transferred from pre-major course work (freshman and sophomore years) to the major (junior and senior years). Students are selectively admitted to the program for their final two years of work.

To be eligible for admission, students must meet the following minimum criteria. The student must have:

1. Successfully completed 58 credit hours.

2. Maintained a grade-point average of 2.0 on a 4.0 scale for all course work completed at the time of entry to the major.

3. Satisfactorily completed So. Wk. 51, "Introduction to Social Work," with a grade of B or higher. Students are encouraged to enroll in So. Wk. 51 during their sophomore year.

4. Submitted a written statement dealing with reasons why the student wishes to major in social work. An outline detailing the items to be covered by this statement is available from the Admissions Office of the School of Social Work.

5. Submitted a letter of reference from the student's So. Wk. 51 instructor. A form to be used for this purpose is available from the Admissions Office of the School of Social Work.

6. Requested an interview with the School of Social Work Admissions Committee prior to being admitted to the program.

Transfer students wishing to enter the program should contact the Coordinator of the B.S.W. Program. This contact should be made no later than the semester prior to their intention to enter the program. Transfer students will be asked to submit an official transcript and must meet the above requirements. Transfer students will be expected to complete So. Wk. 51 during their first semester of course work within the major unless they have course work that is the equivalent of this course. Only social work courses with a grade of B or above from a Council on Social Work Education accredited program will be accepted for transfer to meet requirements of the major.

Complete information concerning WVU admission, fees and expenses may be obtained in Part 2. Academic information is in Part 3.

Requirements for the Degree

The undergraduate program consists of a minimum of 36 upper-division hours in social work, a minimum of 12 upper-division hours in *required social and behavioral sciences courses*, and an additional requirement of 12 upper-division hours with at least 3 hours of sociology, psychology, and political science. In addition, all social work students are required to take 3 hours in course work dealing with racial and other minority groups from a group of courses designated in the undergraduate program. A total of 128 hours are required for the degree, 58 of which must be in upper-division course work. Students must have completed all required social work courses with a grade of C or better.

Students are encouraged to consult with their advisers regarding the selection of electives appropriate for their career interests.

To establish a major sequence and to qualify for graduation, the student must have spent at least two semesters and have accumulated a minimum of 30 hours as an upper-division student in the department of the student's major, or under its guidelines. Also, students must have completed all required social work courses with grades of C or better, maintain an overall grade-point average of 2.0, and maintain a grade-point average of 2.0 or better on all other courses specifically required of the Social Work major.

The specific hours requirements for graduation are:

University Core Curriculum—	*Hr.*
English Composition	6
Core Group A	12
Core Group B	12
Core Group C	12
Total	42

(In the Core Curriculum, students should take the following courses: Psychology 1, Sociology and Anthropology 1 or 102, Economics 51, Political Science 1 or 2, and Biology 166 or 232.)

Social and Behavioral Science Required Courses—	
Psych. 141—Introduction to Human Development	3
Soc. & A. 121—The Family	3
Soc. & A. 211—Social Research Methods	3
Pol. S. 120—State and Local Government	3
Total	12

Additional Requirements of Social and Behavioral Science Requirements (12 hours total with at least 3 hours from each area.)

Psychology—
- 151—Introduction to Social Psychology
- 164—Personal and Social Adjustment
- 279—Community Psychology
- 281—Abnormal Psychology

Sociology and Anthropology—
- 135—Race Relations
- 138—Ethnic Groups
- 140—Social Change in Appalachia
- 233—Sociology and Work Places

Political Science—
- 135—Introduction to Policy Analysis
- 140—Introduction to Public Administration

Total 12

Social Work Required Courses—

Lower Division
- So. Wk. 51—Introduction to Social Work 3

Upper Division
- So. Wk. 200—Social Welfare Policy and Services 3
- So. Wk. 210—Social Welfare Policy and Services in Appalachia 3
- So. Wk. 220—Social Work Methods 1 3
- So. Wk. 222—Social Work Methods 2 3
- So. Wk. 247—Social Work and Human Diversity 3
- So. Wk. 250—Social Functioning and Social Work 3
- So. Wk. 290—Social Work Practice Seminar 3
- So. Wk. 291—Field Practicum 12

Total 36

Minority Content Requirement 3

Electives 23

Total 128

Curriculum Plan

First Year:		*Second Year:*	
Engl. 1	3	So. Wk. 51	3
Engl. 2	3	Soc. & A. 121	3
Electives	3	Pol. S. 120	3
Psych. 1	3	Psych. 141	3
Soc. & A. 1 or 102	3	Minority Content	3
Pol. S. 1 or 2	3	Core A	6
Econ. 51	3	Core C	3
Core A	6	Biology 166	3
Core C	6	Pol. S./Psych./Soc. & A.	3
		Psych./Soc. & A./Pol. S.	3
Total	33	Total	33

Third Year:

So. Wk. 200	3
So. Wk. 210	3
So. Wk. 220	3
So. Wk. 222	3
So. Wk. 247	3
So. Wk. 250	3
Soc. & A./Pol. S./Psych.	9
Electives	6
Total	33

Fourth Year:

So. Wk. 290	3
So. Wk. 291	12
Electives	14
Total	29

The student who wishes to enter the social work program should contact the social work pre-major adviser or Undergraduate Program Coordinator for assistance in course planning and additional information.

Typical Study Load

A normal study load for a social work major is 16 to 18 hours. Students who have a grade-point average below 2.0 and desire to exceed the normal load are strongly discouraged from doing so. Students desiring to carry 19 to 21 hours must petition the Dean of the School of Social Work through their adviser to do so. Students with grade-point averages under 3.0 are rarely permitted to carry more than 18 credit hours. Students are not permitted to carry more than 21 credit hours in any semester.

Field Instruction Requirements

Field instruction is a key component of the total educational experience in the undergraduate program. Through the field instruction program, students "test out" in actual social work service-providing activities their ability to utilize and apply the knowledge, values, and skills which have been acquired through previous course work, the concurrent/block social work practice seminar, and other life experiences.

To enter a field placement, students must be seniors (at least 89 hours completed), have a 2.0 overall grade-point average, have completed So. Wk. 51, 200, 210, 220, 222, and 250 with grades of C or better.

After consultation with their advisers, and with the approval of the Undergraduate Coordinator and Field Instruction Coordinator, students are assigned to approved field placement settings. Students are assigned for field placement activities for one semester as a modified block system or two semesters as a concurrent system during the senior year to a social welfare organization or agency in Monongalia or surrounding counties which meets the criteria for participation in the field instruction program. This instruction requires the student to spend 32 hours per week for one semester's block field instruction and 16 hours per week for two semesters' concurrent field instruction. A minimum of 500 clock hours must be completed during the field placement.

While in field placement, students participate in So. Wk. 290, Social Work Practice Seminar.

To successfully complete requirements for graduation, students must demonstrate through educationally-focused field experience activities, those practice competencies (i.e., combination of social work knowledge, values, and skills) which have been identified as suitable and necessary for entry into professional social work practice.

Career Opportunities

The Bachelor of Social Work degree prepares students for employment in the human services and for further education. Graduates of the program find employment in child welfare services, child and adult protective services, social services in nursing homes and hospitals, family services, school social work and industrial employee assistance programs. The Bureau of Labor Statistics has estimated that the job market for social workers will increase by 22.5 percent by 1990.

The Bachelor of Social Work also provides a sound educational base for those who wish to pursue additional education. Graduates have obtained advanced degrees in social work, law, counseling, rehabilitation, public administration, and education.

Social Work (So. Wk.)

51. *Introduction to Social Work.* I, II. 3 hr. *(Open to sophomores.)* Introductory course to social work and the profession. The helper and the kinds of problems and situations with which the helper may become involved are explored.

200. *Social Welfare Policy and Services.* I. 3 hr. PR: So. Wk. 51 or consent. Introduces the student to the historical background and philosophical concepts which influence the development of social welfare in America. Also, students are exposed to the specific social welfare programs and services which are utilized by the people.

210. *Social Welfare Policy and Services in Appalachia.* II. 3 hr. PR: So. Wk. 200 and 220, or consent. The second social policy course builds upon the content of the first by focusing in greater detail on the process of defining social problems, developing social policies, and implementing social provisions in the Appalachian region.

220. *Social Work Methods 1.* I. 3 hr. PR: So. Wk. 51 or consent. Theories and concepts of intervention, including prevention and rehabilitation with individuals, families, small groups, and communities are discussed. Students examine problem areas of concern to social work and various roles through which those problems can be alleviated. Emphasis on beginning skills in interviewing, observing, recording, problem identification, and analysis.

221. *Field Experience in Social Work.* II. 3 hr. PR: So. Wk. 220 or consent. *(Open to selected non-majors.)* Development of basic helping skills through a supervised volunteer or work experience in a community agency or program.

222. *Social Work Methods 2.* II. 3 hr. PR: So. Wk. 200 and 220. Helps students examine a variety of approaches to intervention, prevention, and rehabilitation. Current programs such as community action, model cities, comprehensive community mental health, organized population groups, services of departments of public welfare, extension, etc.

247. *Social Work and Human Diversity.* I, II. 3 hr. PR: So. Wk. 51 or consent. Social work practice with ethnic and religious minorities, the poor, women, Appalachians, the physically and mentally impaired, etc. Themes include stigmatization, stratification, institutional racism, sexism, and strategies for empowerment and equalization of opportunities and outcomes.

250. *Social Functioning and Social Work.* I. 3 hr. PR: So. Wk. 200, 220; Psych. 141; Soc. & A. 121. Draws on social and behavioral sciences knowledge to provide a framework for analyzing human behavior from a social work practice perspective, emphasizing human differences as they affect life opportunities and the meeting of human needs.

280. *Seminar.* I, II. 1-6 hr. PR: Consent. Current issues in social work. Weekly seminars in topics of human sexuality, poverty, and income security, physical and mental health, housing, racism, children and families, women, aging, and delinquency.

290. *Social Work Practice Seminar.* I, II. 3 hr. PR: So. Wk. 210, 222, 250. Designed to provide educational support for the field placement practicum. Taken simultaneously with the practicum to assist the student in the integration and mastery of practice theory as applied to placement learning activities.

291. *Field Practicum.* I, II. 6 or 12 hr. PR: So. Wk. 210, 222, 250. Provides an opportunity to test and apply professional values, knowledge, and skills acquired through course work and life experience. Placement in a social welfare context, under supervision, prepares students to become competent generalist social workers. *(Offered on Pass/Fail basis only.)*

Part 5
INTERDISCIPLINARY PROGRAMS

WVU Extension and Public Service

The pioneers in the land-grant movement intended to establish institutions through which knowledge and learning would become an effective part of the daily lives of American people. West Virginia University is such an institution.

WVU Extension and Public Service develops educational programs to meet the needs and concerns of adults and youth throughout the state. Its educational programs are established within the general framework of four broad program areas: Continuing Education Programs; Agriculture, Forestry, and Community Development; Personal and Family Development; and 4-H Youth Development. In addition to the Morgantown campus, one of the most intensively used WVU facilities is the unique continuing education and conference center known as Jackson's Mill. The State 4-H camp is regarded as a focal point for off-campus, "away from home" classes and conferences of varying lengths and objectives.

Program determination focuses on analysis of problems, interests, and concerns of people. As new knowledge and technology become available, informational and instructional programs are planned and conducted to meet clientele interests. Program development is a continuous interaction process involving dialogue, joint decision making, and coordination among staff members, other units of the University, U.S. Department of Agriculture, various Extension committees, and advisory groups representing the clientele. Program faculty at an Extension office in each county provides direct access for extending educational programs to the people.

Financing comes from state appropriations to the University, federal funds, county commissions, and county boards of education.

Division for Continuing Education

The Division for Continuing Education expands lifelong learning opportunities among all people by offering research and educational programs related to personal, career, professional, and social development. The division includes the Conference Office, Continuing Education Unit (CEU) Program, Business and Management Extension, Fire Service Extension, Institute for Labor Studies, and Special Interest Programs for adults.

The division works with academic departments, faculty, and community leaders to develop activities to serve special interest needs. Formats include day and evening short courses, seminars, and intensive workshops. Programs are designed for career update, relicensure, professional development, and personal enrichment.

For further information, call 293-4013, or write Division Leader for Continuing Education, P.O. Box 6031, West Virginia University, Knapp Hall, Morgantown, WV 26506-6031.

Conference Office

The Conference Office collaborates with academic units, faculty and staff, student organizations, and community and professional groups to provide a multitude of educational activities. Typical programs include the annual Fine Arts Music Camp, New Student Orientation, West Virginia Bankers Association School, and Eastern Gas Compression Roundtable.

Continuing Education Unit (CEU) Program

The Continuing Education Unit (CEU) is used for the measurement, recording, accumulation, transfer, and recognition of participation by adults in non-credit programs. The CEU program gives recognition on a national basis to persons continuing their education and keeping up-to-date in their chosen fields by participating in WVU-sponsored, non-credit continuing education.

Business and Management Extension

The Business and Management Extension program offers educational activities designed to meet the management information needs of both public and private enterprises.

Fire Service Extension

Training for West Virginia's fire fighters is offered by Fire Service Extension. The fundamentals of fire suppression are taught in basic, advanced, and regional schools conducted throughout the state. In addition to fire suppression and rescue training, programs for fire department officers and instructor training programs for training officers and field instructors also are offered.

Institute for Labor Studies

The Institute for Labor Studies conducts educational and research programs for workers and their organizations. Subject matter ranges from skill courses, such as steward training, collective bargaining, work measurement, union administration, job evaluation, and contract administration, to a liberal arts curriculum covering such subjects as labor and economy, government and society, and labor history. Research ranges from collective bargaining studies and attitude surveys, to economic analysis.

Division of Agriculture, Forestry, and Community Development

The Division of Agriculture, Forestry, and Community Development has six program units: Animal Sciences, Plant Sciences, Forestry, Resource Management, Community Development, and Energy. Each unit conducts educational programs and provides technical assistance to enhance rural development in West Virginia.

The division's primary objective is to collect, translate, and diffuse to clientele knowledge that has been generated within WVU and similar institutions and organizations in West Virginia and neighboring states. Many opportunities exist for students to support local program activities in a variety of subject-matter areas.

Areas of specific interest to the division in pursuit of its educational objectives are: (1) improvement of animal, crop, and horticultural production through breeding and management; (2) improvement of pasture and forage production levels; (3) proper utilization of land and conservation of land and natural resources; (4) economical weed and pest control techniques; (5) environmentally and economically sound forestry production, harvesting, and utilization schemes; (6) maintenance of air and water quality; (7) expansion of animal and solid-waste management programs; (8) wildlife management; (9) energy conservation and management; (10) land reclamation;

(11) improvement of the leadership and decision-making capabilities of adult and youth community groups, organizations, agencies, and public officials to enhance their efforts to secure better housing, transportation, social services, water and sewage systems, recreational facilities, and local government; (12) energy conservation; (13) efficient use of West Virginia's natural resources—renewable and nonrenewable; and (14) improved use of community resources in rural development programs.

Division of Personal and Family Development

The Division of Personal and Family Development provides educational programs designed to assist individuals and families to improve their quality of life. Programs are developed to facilitate identification of needs, decision making, and more effective utilization of resources. Focus areas include: management of personal and family resources; promotion of nutritious, safe, and attractive meals; strengthening interpersonal relationships within the family and community; providing attractive and safe home environments; and planning and caring for textiles and clothing. Program thrusts for the division include: personal and family resource management, leadership development, and nutrition education.

Money management skills are emphasized in all areas of programming since food, health, housing, and clothing consume the major portion of an individual or family's take-home pay. Management processes as resources are emphasized when dealing with societal changes. These competencies are important at all stages of the life cycle but are especially important to young adults establishing life-styles, making decisions about acquiring skills and material goods, and extending their interaction with the total environment.

Opportunity is provided through the West Virginia Extension Homemakers program for more than 15,000 women and men to participate in organized clubs in every county. Development of leadership capacities is a major goal with opportunity for participation at local, area, and state conferences and seminars designed to enhance individual and organizational leadership skills.

Programs designed for limited income families include the Expanded Food and Nutrition Program. Utilizing community-based paraprofessionals, the program seeks to improve the general nutritional well being of limited income families in West Virginia. A strong food preservation program prevails with emphasis on the dissemination of accurate, scientifically based information.

Division of 4-H-Youth Development

The mission of 4-H-Youth Development is to promote the personal development of youth individually and as responsible and productive citizens.

Four-H operates within two variations of the traditional school learning environment. One variation is the community-based, family involved 4-H club. With support from community volunteers such as teachers and parents, clubs provide learning experiences in over 100 different subjects. Nutrition education is offered under special federal funding and is especially designed to reach West Virginia's disadvantaged population.

A second strategy is the "away from home" type of programming represented in 4-H camping and 4-H exchanges between counties, states, and countries. These play an important part in the development of a young person.

Jackson's Mill

Jackson's Mill is one of the nation's unique educational facilities. Operated by WVU Extension and Public Service, Jackson's Mill became the nation's first State 4-H Camp in 1924. It serves as a statewide conference center for leadership development.

The site of numerous 4-H camps and conferences, Jackson's Mill also provides facilities for other youth groups as well as adult-oriented organizations for conferences, seminars, retreats, workshops, and credit courses.

The scenic environment of Jackson's Mill offers a special kind of setting for educational opportunities.

Applied Research, Evaluation, and Development

The Applied Research, Evaluation, and Development unit designs and conducts interdisciplinary research relating to the social and economic development. Research topics include human resource development, transportation, coal mine health and safety, energy use and conservation, and natural resource development and management. The unit also conducts educational needs assessments and program evaluation research for WVU Extension and Public Service, other WVU units, state and federal governmental agencies, and private organizations.

Information and Educational Technology

The Information and Educational Technology unit delivers information to the public through the mass media (radio, television, and newspapers); produces communication support materials such as publications, slide/tape sets, videocassettes, and exhibits; and teaches communication skills that result in expanded, more efficient, and more effective faculty communication approaches and programs. Undergraduate and graduate internships working with the unit are available through the WVU School of Journalism.

Gerontology Center

The West Virginia University Gerontology Center reflects the University's commitment to increasing understanding of the aging process and supporting efforts to improve the quality of life for elderly persons, particularly the rural elderly of Appalachia. The Gerontology Center promotes and coordinates interdisciplinary teaching, research, and service in gerontology at WVU. University units involved in teaching and research in human aging include the College of Arts and Sciences, the College of Human Resources and Education, the College of Agriculture and Forestry, the School of Physical Education, the School of Social Work, the School of Medicine, the School of Nursing, the School of Pharmacy, and WVU Extension and Public Service. The Gerontology Center's library collection augments the gerontology holdings of other campus libraries, and is open to the entire community Monday through Friday, 8:30 a.m.-5:00 p.m.

Because the growth of the elderly segment of our population is affecting all aspects of U.S. society, a focus on gerontology promises to enhance the professional qualifications of students in a variety of disciplines, increasing employability of students in human service and health science areas, in academic settings, and in business and the private sectors.

The Gerontology Center offers an 18-credit-hour Undergraduate Certificate program for students who wish to obtain a foundation of knowledge in gerontology while pursuing a degree in another field. Requirements for the certificate include MDS 50—Introduction to Gerontology (3 hr.), MDS 250—Issues in Gerontology (3 hr.), and a total of 12 hours in field experience and electives selected from an approved pool of aging-related courses offered in a number of disciplines.

A Practitioner Certificate in gerontology, based on continuing education credits, is available for persons who are currently working with the elderly.

Further information and assistance in academic program planning in multidisciplinary gerontology, and registration forms, may be obtained from Betty Maxwell, Administrative Assistant, WVU Gerontology Center, Chestnut Ridge Professional Building, Morgantown, WV 26506, (Telephone: 304-293-2081).

Courses of Instruction in Gerontology (Geron.)

Upper Division

291. *Special Topics.* I, II. 1-3 hr. PR: Consent. Special problems for undergraduate and graduate students working on certificate programs. Topics change from semester to semester; students can enroll more than once. (*Does not qualify for Core credit.*)

[*NOTE:* See Multidisciplinary Studies (MDS) section for additional courses in Gerontology.]

Oak Ridge Associated Universities

West Virginia University is a sponsor of Oak Ridge Associated Universities (ORAU), a nonprofit, education and research management corporation of 43 colleges and universities. ORAU, established in 1946, conducts programs of research, education, information, and human resource development for a variety of government and private organizations. It is particularly interested in three areas: energy, health, and environment.

Among ORAU's activities are competitive programs to bring undergraduate and graduate students and faculty members to work on research problems at the research facilities of the Department of Energy (DOE) and other federal agencies. Participants are selected by ORAU and the staffs of the facilities participating in the ORAU programs, which are Oak Ridge National Laboratory; the Oak Ridge Y-12 Plant; the Oak Ridge Gaseous Diffusion Plant; the Atmospheric Turbulence and Diffusion Division in Oak Ridge; the Savannah River Laboratory in Aiken, S.C.; the Pittsburgh Research Center; the National Center for Toxicological Research in Jefferson, AR; the Puerto Rico Nuclear Research Center; and the Energy Research Centers in Pittsburgh, Pa., and Morgantown. The ORAU Institute for Energy Analysis, the Professional Training Program, the Medical and Health Sciences Division, and its other programs are also open to qualified students and faculty members.

Professional Internship Program. Program apppointment periods that alternate with terms of full-time academic study at the students' home institutions afford students opportunities to apply the theories and methods learned in the classroom in a research environment under the guidance of a research adviser.

Graduate Internship Program. Internships at federal laboratories relate to the student's major and career goals, provide opportunities to apply

theories and methods learned in the classroom, and introduce the student to research areas for consideration as possible thesis or dissertation topics.

Post-Graduate Research Program. Research appointments are available for recent masters and doctoral degree recipients. Up to two years of support for collaborative research at federal labaoratories is provided.

Faculty. Faculty members of WVU, under the ORAU Faculty Reseach Participation Program, can go to a Department of Energy facility for varying periods up to three months, for advanced study and research. It is also possible to combine a sabbatical with a longer appointment. Part-time appointments during the academic year are also available at certain laboratories.

Stipends. Student stipends are at fixed rates that change from time to time. Faculty stipends are individually negotiated, based upon the current University salary.

For more information about the ORAU program, contact Trina Karolchik or Richard A. Bajura, WVU Energy Research Center, 258 Stewart Street, Morgantown, WV 26506, or write to: University Programs Division, Oak Ridge Associated Universities, Inc., P.O. Box 117, Oak Ridge, TN 37830-0117.

Center for Women's Studies

Judith G. Stitzel, Ph.D. (U. Minn.)—*Director.* Feminist pedagogy, Women in development. *Professor of English.*

The Center for Women's Studies grows out of West Virginia University's commitment to address the complex and varied needs of the women and men of the future. New career opportunities, new flexibility in male and female roles, new economic realities, and new scholarship on women are challenging us all to rethink old assumptions and explore new possibilities for our lives. Established in 1984 within the office of the Vice President for Academic Affairs and Research, the center is a response to this intellectual challenge. The center acts to facilitate and stimulate teaching and research throughout the University and the community on women and gender-related issues and to coordinate the interdisciplinary Women's Studies Program.

The basic premise of the Women's Studies Program is that knowledge of women's experiences and achievements is fundamental to our knowledge of humankind and that the inclusion of women's experiences and achievements in the curriculum is central to a liberal arts education.

Academic Opportunities in Women's Studies

Certificate Program

An Undergraduate Certificate in Women's Studies is available through the center to students in all colleges and may be pursued concurrently with any individual major. The certificate recognizes a specific concentration of women's studies courses. The completion of such a program would constitute a valuable professional credential for graduates in a variety of careers necessitating an understanding of women's issues.

Students may fulfill the program requirements through a combination of required and elective courses totaling 19 credit hours with a 2.75 grade-point average. Women's Studies 40 and Women's Studies 240 are required of all certificate students (7 hours). Students may choose from among electives (including independent study and field experience) for the remaining 12 credits. Additional details about the certificate are available from the center.

Individualized Degree Program

There are possibilities for individualized degree programs, coordinated through the office of the Dean of the College of Arts and Sciences; preliminary information is available from the Director of the Center for Women's Studies.

In addition to the women's studies courses listed below, other courses focusing on women and gender and independent study opportunities are available in several University departments. The Center for Women's Studies also sponsors workshops, seminars, and special lectures to bring the concerns of the women's studies area before the University and community. *Women's Studies News* is published twice each semester to announce program activities, events of interest and new resources for research and instruction. To receive a detailed schedule of courses and further information about the activities, contact the Center for Women's Studies, 200 Clark Hall, 293-2339.

Courses of Instruction in Women's Studies (Wm. St.)

Lower Division

40. *Introduction to Women's Studies.* I, II. 3 hr. (*May be credited to University Core A or B.*) The major contexts in which woman's identity has been and is defined and of the relationships between these definitions and the roles and history of women (and men) in society and culture. *(Also listed as MDS 40.)*

Upper Division

191. *Special Topics.* I, II, S. 1-6 hr. PR: Consent. Interdisciplinary studies on women and gender within the humanities, social sciences, and natural sciences. Topics change from semester to semester; students can enroll more than once.

194. *Field Experience.* I, II, S. 1-6 hr. PR: Consent. Supervised interdisciplinary experiences carried out in connection with government, social service, and other approved agencies, organizations, and women-centered projects.

240. *Methods and Perspectives in Women's Studies.* I, II. 4 hr. PR: 9 hr. in approved women's studies courses and junior standing, or consent. An exploration of major theoretical perspectives on and research methods appropriate to the interdisciplinary study of women and gender.

290. *Independent Study.* I, II, S. 1-6 hr. PR: Consent. Individual study of an interdisciplinary issue in women's studies and/or gender studies.

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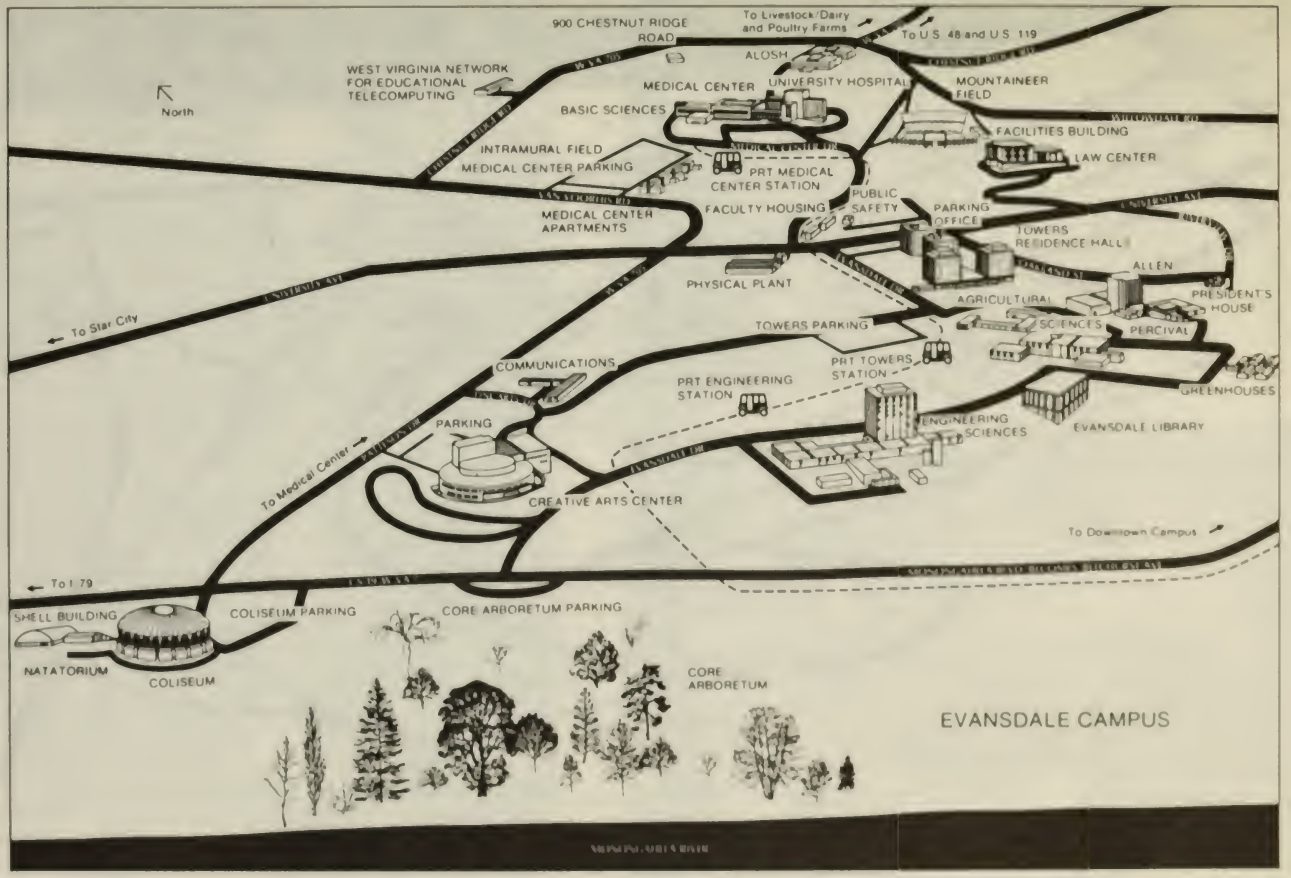
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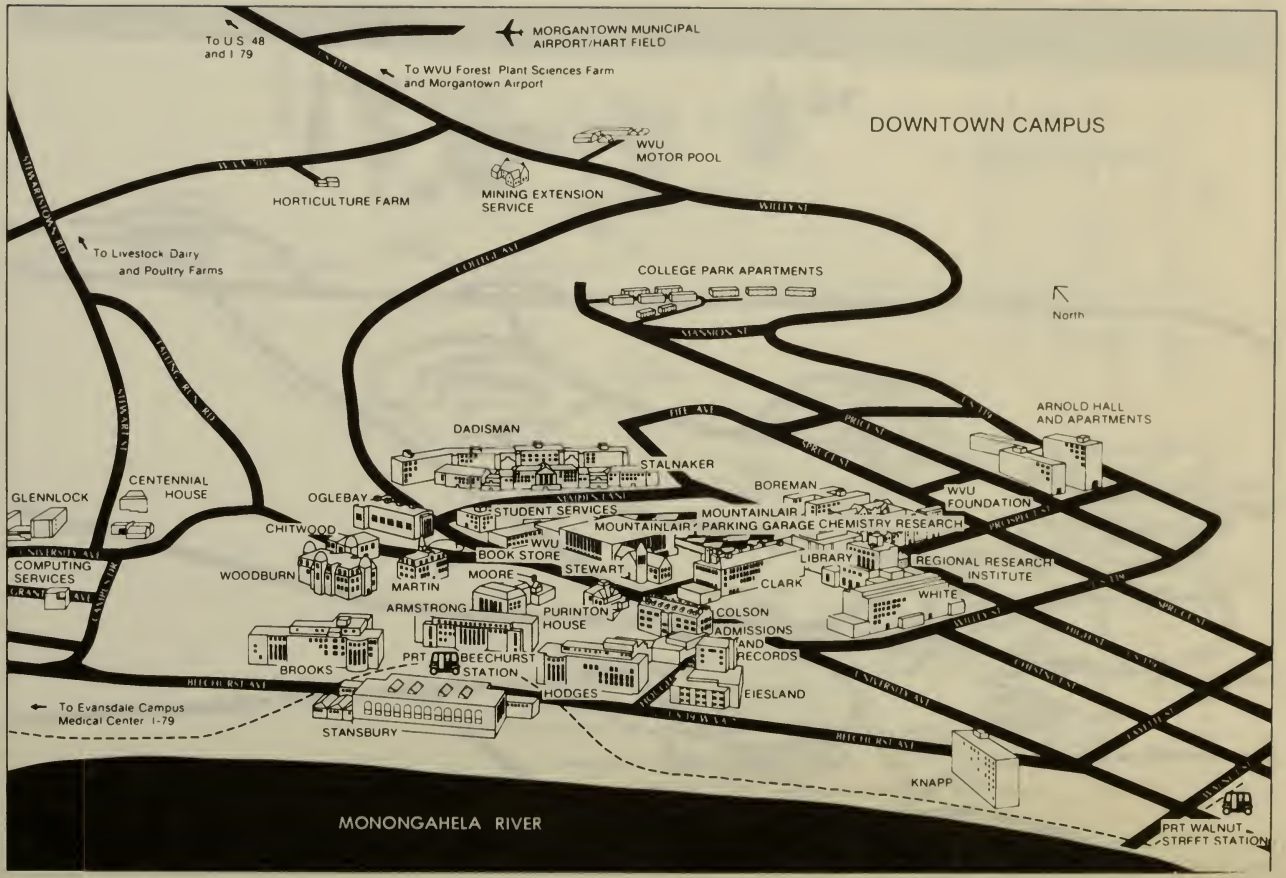
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Right, the College of Human Resources' microcomputer lab in Allen Hall—one of several computer facilities available for student use on the Morgantown campuses. Below, a tutoring session in Towers Residence Halls.

Evansdale Library

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